SECTION 1

OVERALL MACHINE INFORMATION

1. SPECIFICATIONS

Configuration:	Desk top
Copy Process:	Dry electrostatic transfer system
Originals:	Sheet/Book
Original Size:	Maximum A3/11"x17"
Copy Paper Size:	Maximum A3/11"x17" Minimum A6/5 1/2" x 8 1/2" (lengthwise)
(Duplex Copying)	A4 and B5/8 1/2" x 11" (sideways)
Copy Paper Weight:	Cassette feed: 52 to 157 g/m^2 (14 to 42 lb) Paper tray feed: 64 to 90 g/m^2 (17 to 22 lb) Manual feed: 52 to 157 g/m^2 (14 to 42 lb) Duplex: 59 to 104 g/m^2 (16 to 27 lb)
Reproduction Ratio:	2 Enlargement and 3 Reduction

	A4/A3 Version	LT/LDG Version
Enlargement	141% 122%	155% 129%
Full size	100%	100%
Reduction	93% 82% 71%	93% 74% 65%

Zoom:	From 50% to 200% in 1% steps
Copying Speed:	18 copies/minute (A4/8 1/2" x 11" sideways) 10 copies/minute (A3/11" x 17")
Warm-Up Time:	60 seconds (at 20ºC)
First Copy Time:	5.9 seconds (A4/8 1/2" x 11" sideways)
Copy Number Input:	Ten keys, 1 to 99 (count up)
Manual Image Density Selection:	7 steps

Automatic Reset: 1 minute standard setting; can also be set to 3 minutes or no auto reset.

Paper Capacity:
Cassettes: 500 sheets
Paper tray: 250 sheets
Manual feed table: 50 sheets

Toner Replenishment:
Black: Cartridge exchange (370g/cartridge)
Color (red, blue, & green): Cartridge exchange (310g/cartridge)

Copy Tray Capacity:
250 sheets (B4/8 1/2" x 14" and smaller)
100 sheets (A3/11" x 17")

Power Source:
110V/ 60Hz/ 15A (for Taiwan)
115V/ 60Hz/ 15A (for N.A.)
220V/ 50Hz/ 8A (for EU.)
220V/ 60Hz/ 8A (for EU.)
240V/ 50Hz/ 8A (for EU.)

(Refer to the serial number plate (rating plate) to determine the power source required by the machine.)

Power Consumption:
Maximum: 1.2 kw
Warm-up: 0.72 kw (average)
Ready: 0.16 kw (average)
Copy cycle: 0.81 kw (average)

Dimensions:

	Width	Depth	Height
Copier only	672 mm (26.5")	600 mm (23.7")	410 mm (16.2")
Full system	1149 mm (45.3")	600 mm (23.7")	513 mm (20.2")

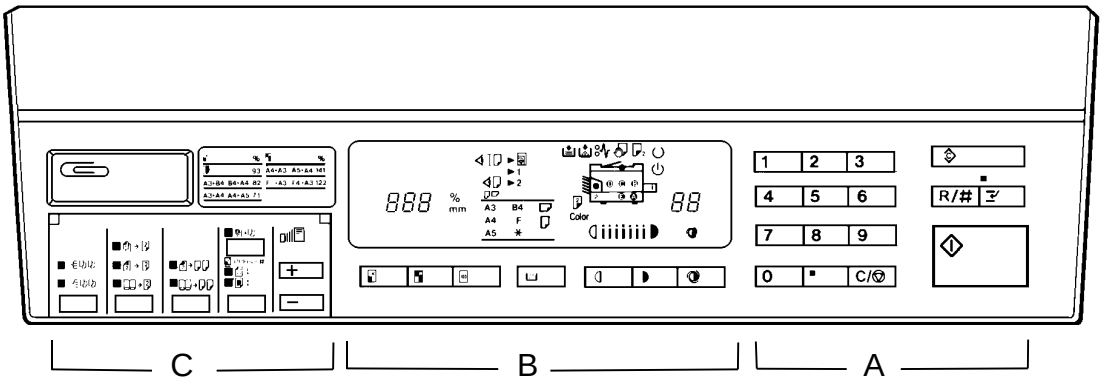
Weight:
Copier only: 52 kg (114.7 lb)
Full system: 71 kg (156.6 lb)

Optional Equipment:
Document feeder
10 bin sorter
Duplex unit
Color development unit
Key counter
Universal Cassette

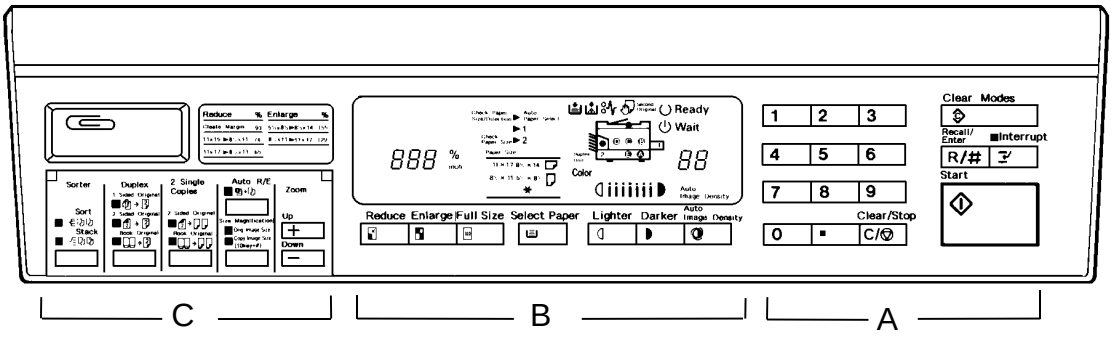
- Specifications are Subject to change without notice.

2. OPERATION PANEL

— A4/A3 Version —



— LT/LDG Version —



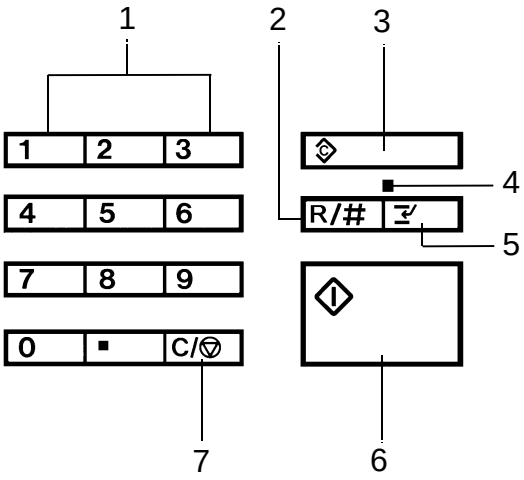
Section A: See page 1-4.

Section B: See page 1-5 or 1-6.

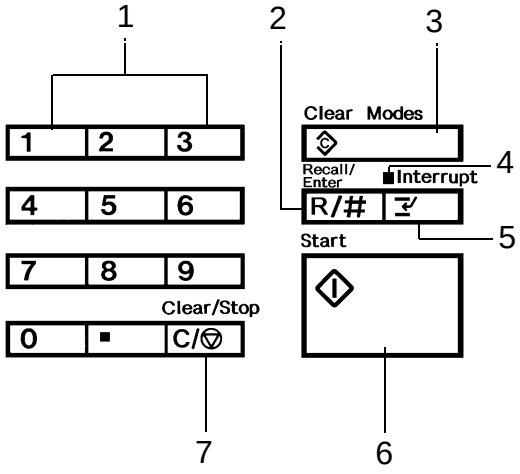
Section C: See page 1-7 or 1-8.

Section A —

— A4/A3 Version —



— LT/LDG Version —



1. **Number Keys**
   The number keys are used to enter the desired number of copies. They are also used to input the sizes of the original and the copy image when in size magnification mode.

2. **Recall/Enter Key**
   Press to display the number of copies entered. Also use to enter or change data when in size magnification mode.

3. **Clear Modes Key**
   Press to clear all previously entered settings and modes.

4. **Interrupt Indicator**
   Lights when interrupt mode is selected.

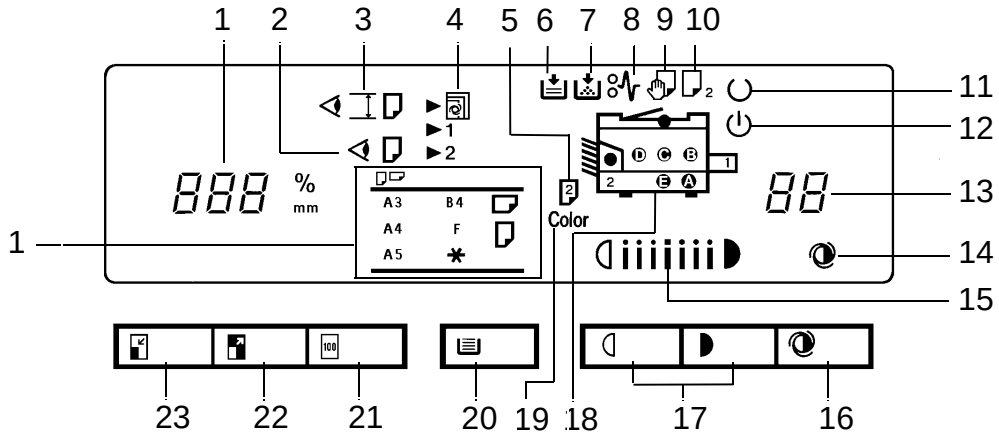
5. **Interrupt Key**
   Press to make interrupt copies during a copy run.

6. **Start Key**
   Press to start copying.

7. **Clear/Stop Key**
   Press to cancel the copy number entered. While copying, press to stop copying.

— Section B —

— A4/A3 Version —



1. Magnification Ratio Indicator

Shows the selected reproduction ratio and data for the Size Magnification mode.

2. Check Paper Size Indicator

Lights when improper paper size is selected in the book original mode or the duplex mode. (Copying is impossible.)

3. Check Paper Size/Direction Indicator

Blinks when the original size does not match with the paper size or direction. This indicator is functional only with the document feeder. (Copying is possible.)

4. Auto Paper Select Indicator

Lights when auto paper select mode is selected. This mode is an optional feature with the document feeder.

5. Duplex Unit Indicator

Lights when the duplex unit is installed.

6. Load Paper Indicator

Lights when the cassette or the paper tray in use runs out of paper.

7. Add Toner Indicator

Blinks when it is time to change the toner cartridge. When it is continuously lit, the copier cannot be used until a new cartridge is installed.

8. Check Paper Path Indicator

Lights if there is a misfeed within the machine.

9. Manual Feed Indicator

Lights when the manual feed table is open.

10. Second Original Indicator

Lights when it is time to position the second original on the exposure glass when making duplex copies.

— Light ON —

If copying has been completed, press duplex key to cancel the duplex mode and press start key to eject copies.

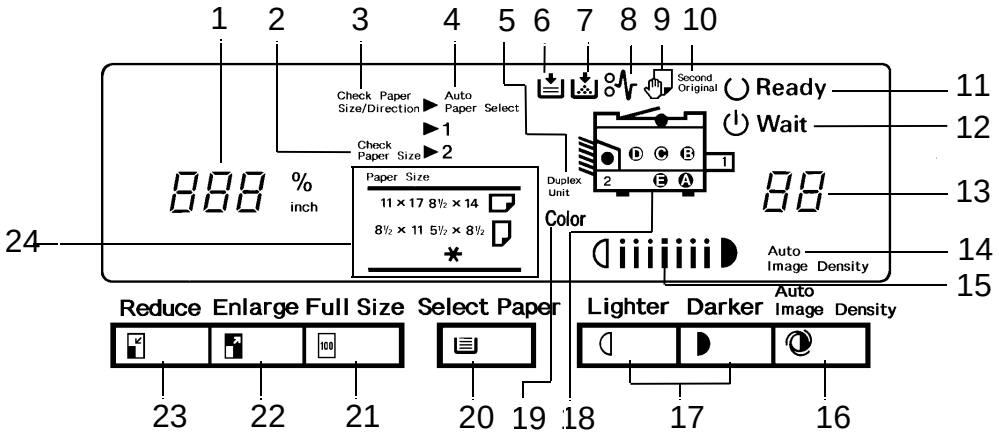
— Light Blinking —

Press start key to eject copies.

11. Ready Indicator

Lights when the machine is ready to make copies.

— LT/LDG Version —



12. Wait Indicator
Lights when that the machine is not ready to copy.

13. Copy Counter
Displays the number of copies entered. While copying, it shows the number of copies made.

14. Auto Image Density Indicator
Lights when the copier is automatically controlling image density. If this indicator blinks, refer to page 55.

15. Manual Image Density Indicator
Shows the manually selected image density. If this indicator blinks, refer to page 55.

16. Auto Image Density Key
Press to select/cancel the automatic image density mode.

17. Manual Image Density Keys
Use to cancel the automatic image density mode and manually select the image density level.

18. Misfeed Location Display
Shows the location(s) of misfed paper.

19. Color Copy Indicator
Lights if a color toner development unit is installed.

20. Select Paper Key
Press to select the cassette or the paper tray for paper feed, or press to cancel auto paper selection mode when the document feeder is installed.

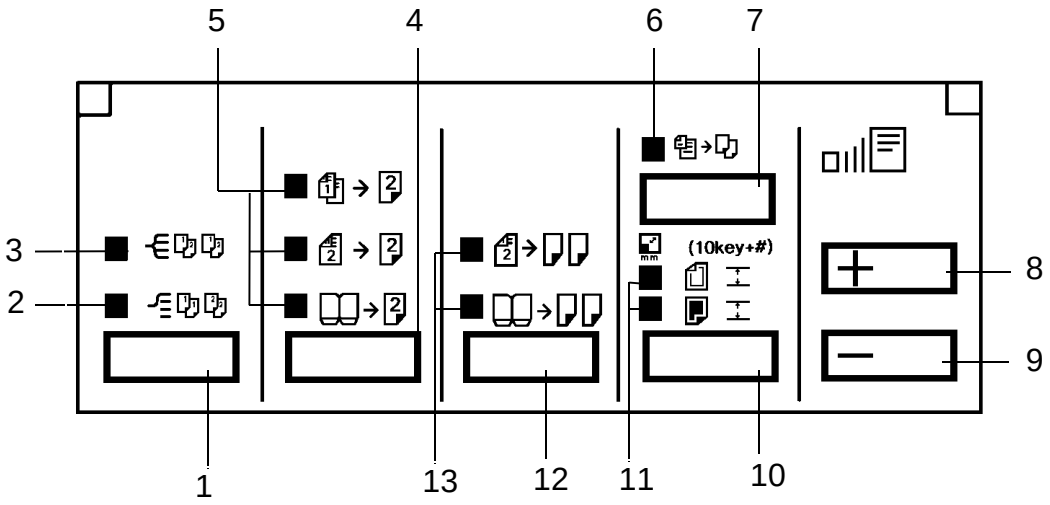
21. Full Size Key
Press to make copies the same size as the originals.

22. Enlarge Key
Press to make enlarged copies.

23. Reduce Key
Press to make reduced copies.

24. Paper Size Indicator
Shows the size and direction of the paper in use.

— Section C —
— A4/A3 Version —



1. Sorter Key
Press to select the sort or stack mode. The sort mode and stack mode are optional features requiring a sorter.

2. Stack Indicator
Lights when in the stack mode.

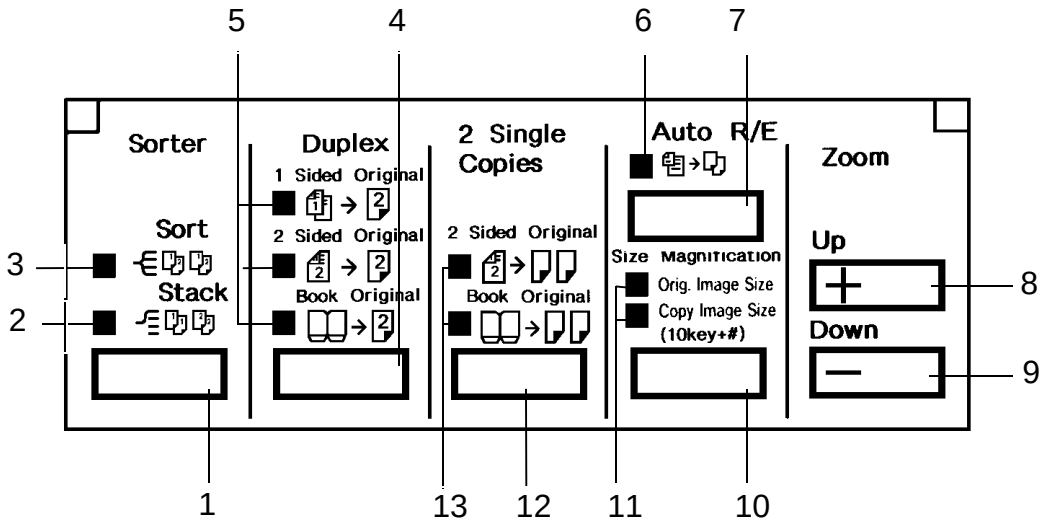
3. Sort Indicator
Lights when in the sort mode.

4. Duplex Key
Press to select one of three duplex modes. These modes are optional features requiring a duplex unit.

5. Duplex Indicators
Show which duplex copying mode is selected.

6. Auto Reduce/Enlarge Indicator
Lights when in the auto reduce/enlarge mode. This mode is an optional feature requiring a document feeder.

— LT/LDG Version —



7. Auto Reduce/Enlarge Key
Press to select the auto reduce/enlarge mode. This mode is an optional feature requiring a document feeder.

8. Zoom Up Key
Press to increase the reproduction ratio in 1% steps.

9. Zoom Down Key
Press to reduce the reproduction ratio in 1% steps.

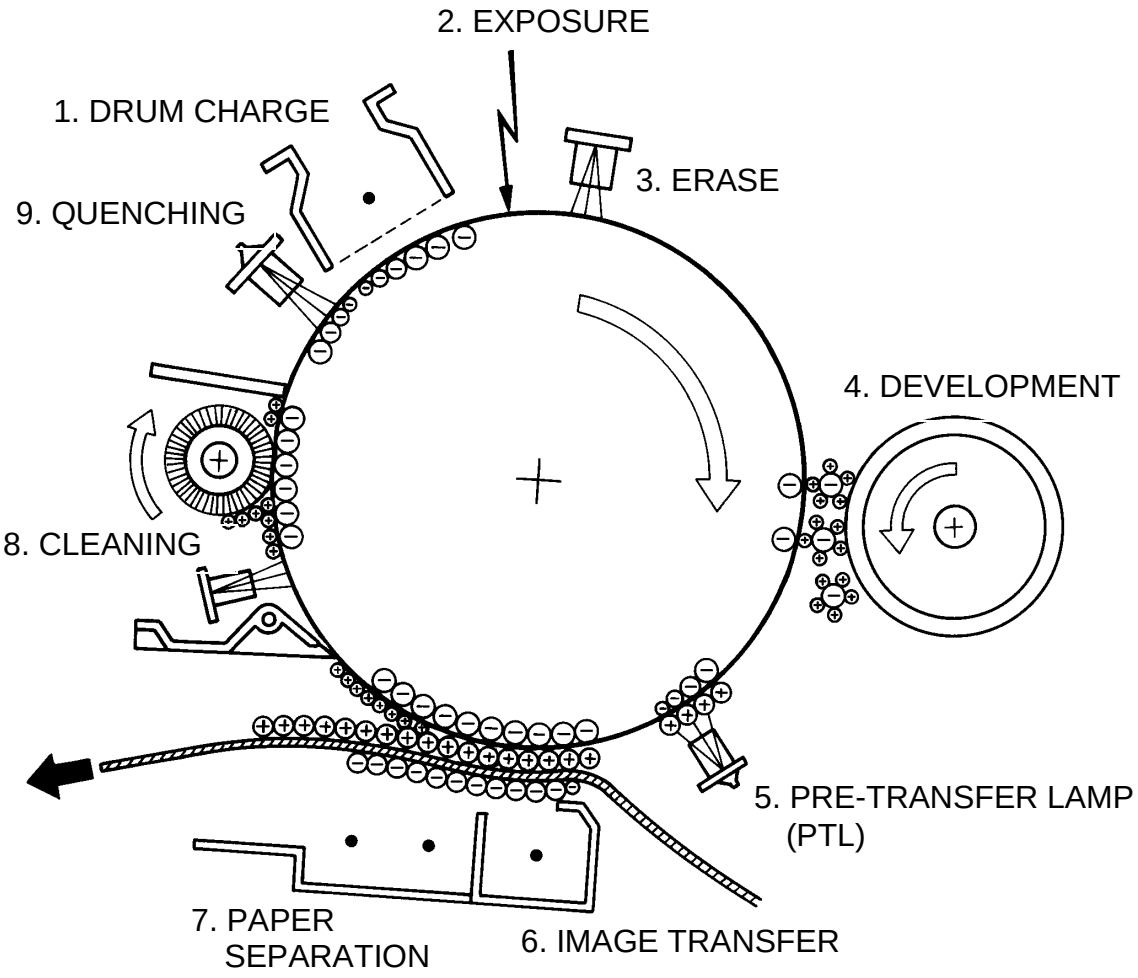
10. Size Magnification Key
Press to select the size magnification mode.

11. Size Magnification Indicators
Lights when in the size magnification mode; shows when to enter the original size and copy size data.

12. 2 Single Copies Key
Press to select one of two 2 single copies modes. The 2 Sided Original mode is an optional feature requiring a document feeder.

13. 2 Single Copies Indicators
Show which the 2 single copies mode is selected.

3. COPY PROCESSES AROUND THE DRUM



1. DRUM CHARGE

In the dark, the charge corona unit gives a uniform negative charge to the organic photoconductive (OPC) drum. The charge remains on the surface of the drum because the OPC drum has a high electrical resistance in the dark.

2. EXPOSURE

An image of the original is reflected to the OPC drum surface via the optics assembly. The charge on the drum surface is dissipated in direct proportion to the intensity of the reflected light, thus producing an electrical latent image on the drum surface.

3. ERASE

The erase lamp illuminates the areas of the charged drum surface that will not be used for the copy image. The resistance of the drum in the illuminated areas drops and the charge on those areas dissipates.

4. DEVELOPMENT

Positively charged toner is attracted to the negatively charged areas of the drum, thus developing the latent image. (The positive triboelectric charge is caused by friction between the carrier and toner particles.)

5. PRE-TRANSFER LAMP (PTL)

The PTL illuminates the drum to remove all negative charge from the exposed areas of the drum. This prevents the toner particles from being reattracted to the drum surface during paper separation and makes paper separation easier.

6. IMAGE TRANSFER

Paper is fed to the drum surface at the proper time so as to align the copy paper and the developed image on the drum surface. Then, a strong negative charge is applied to the back side of the copy paper, producing an electrical force which pulls the toner particles from the drum surface to the copy paper. At the same time, the copy paper is electrically attracted to the drum surface.

7. PAPER SEPARATION

A strong ac corona discharge is applied to the back side of the copy paper, reducing the negative charge on the copy paper and breaking the electrical attraction between the paper and the drum. Then, the stiffness of the copy paper causes it to separate from the drum surface. The pick-off pawls help to separate paper.

8. CLEANING

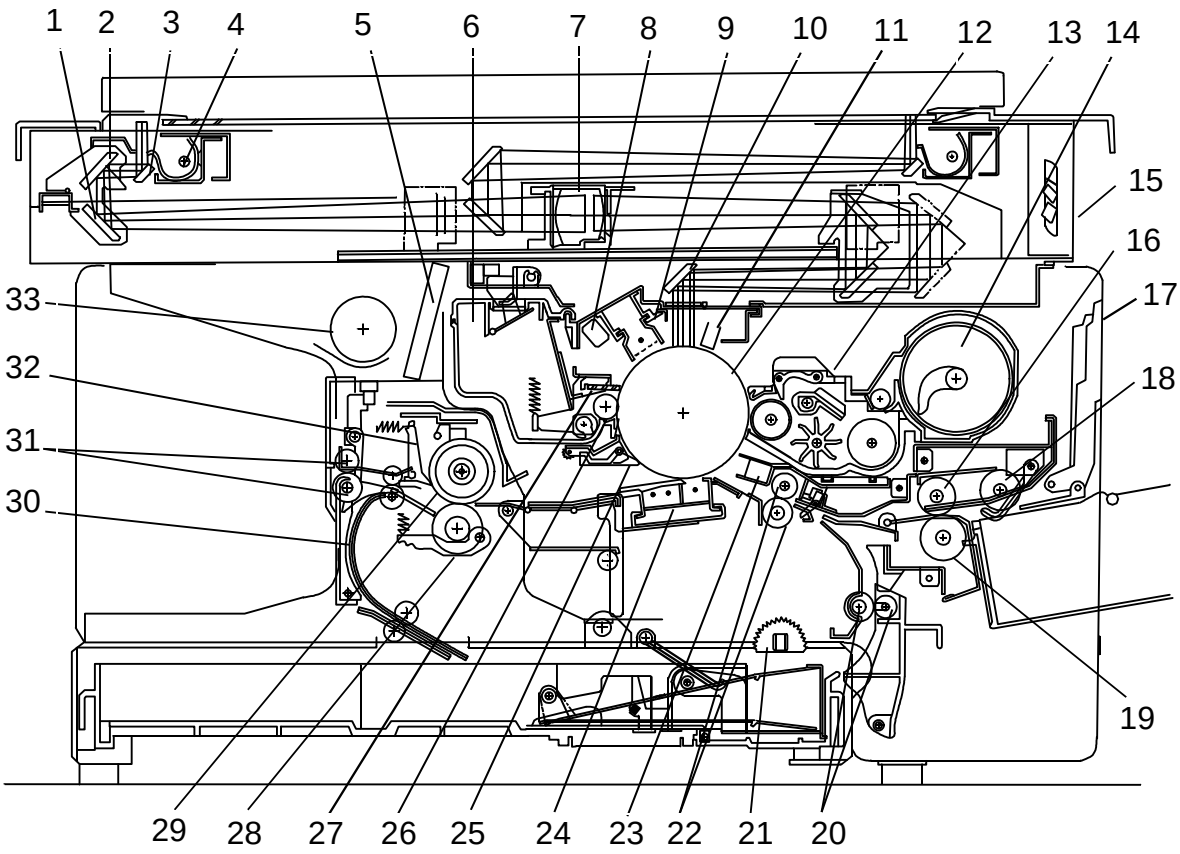
The cleaning brush removes most of the toner on the drum and loosens the remainder. Then the cleaning blade scrapes off the loosened toner.

9. QUENCHING

Light from the quenching lamp electrically neutralizes the surface of the drum.

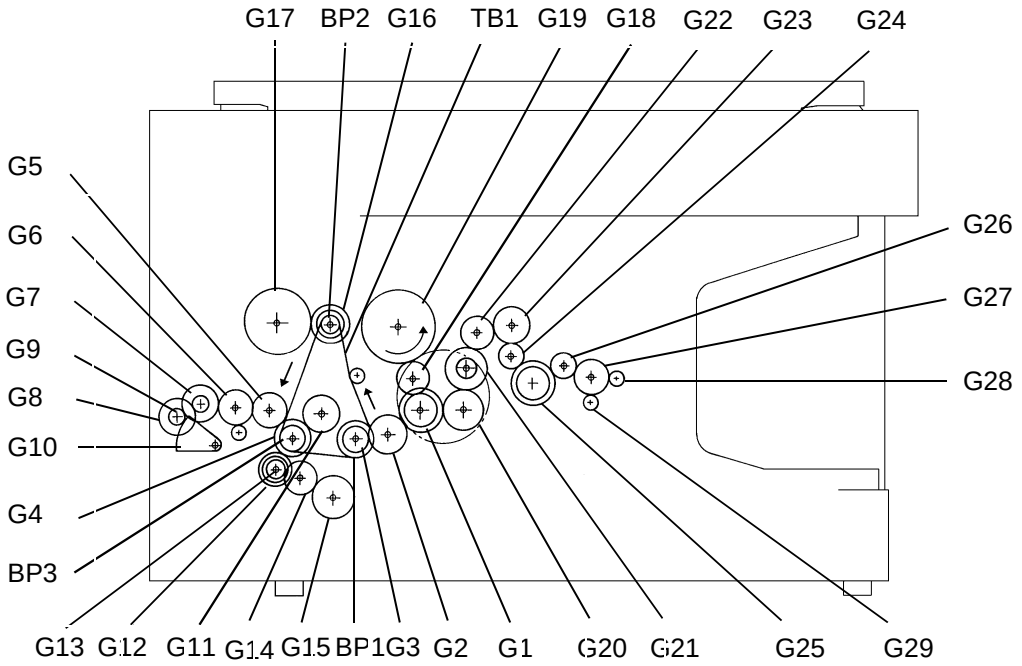
4. FUNCTIONAL OPERATION

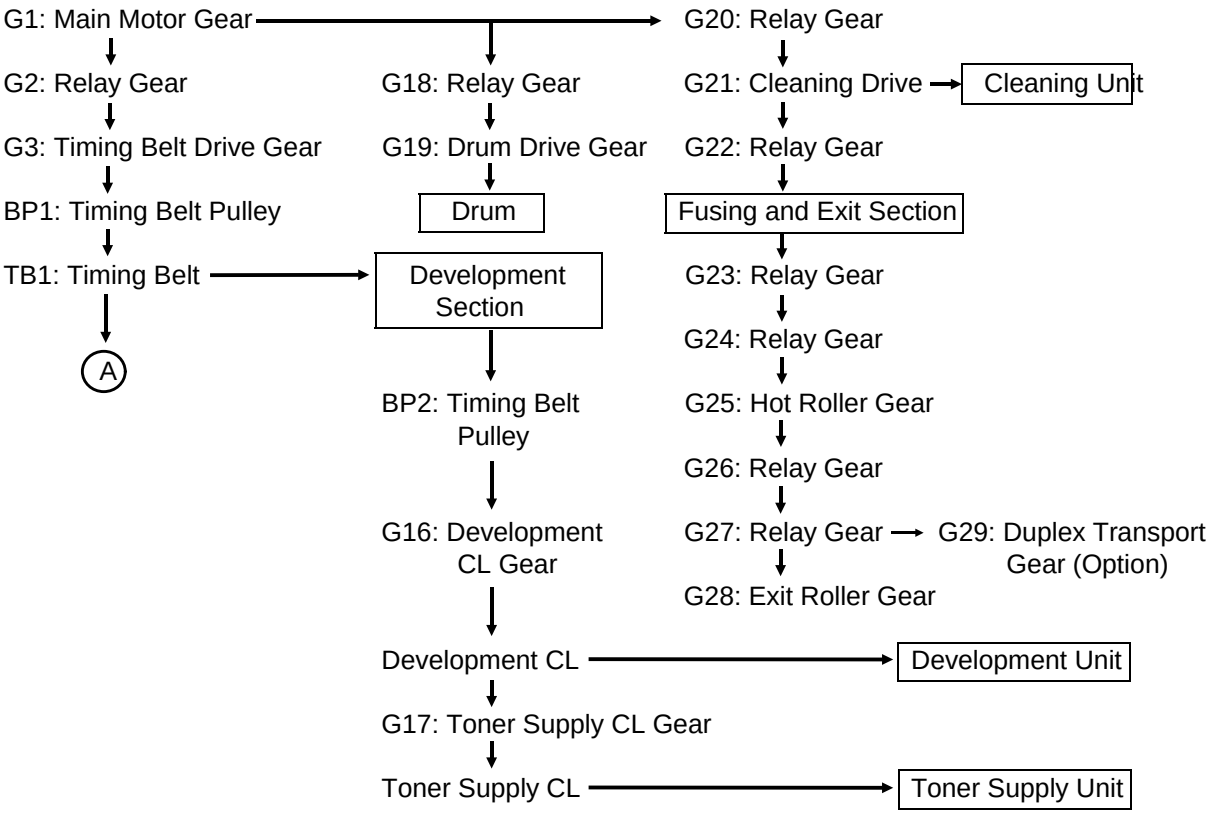
5. MECHANICAL COMPONENT LAYOUT

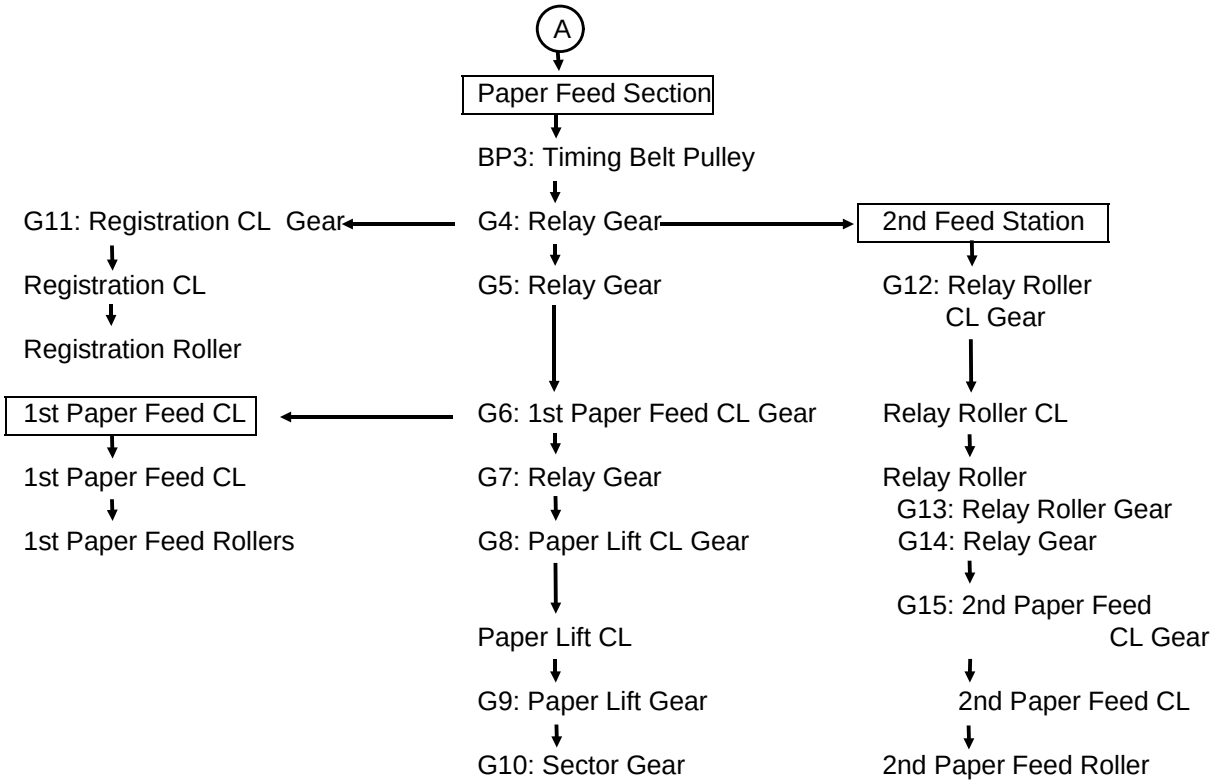


1. Third Mirror
2. Second Mirror
3. First Mirror
4. Exposure Lamp
5. Ozone Filter
6. Cleaning Unit
7. Lens
8. Quenching Lamp (QL)
9. Charge Corona Unit
10. Sixth Mirror
11. Erase lamp (EL)
12. OPC Drum
13. Development Unit
14. Toner Supply Unit
15. Optics Cooling Fans
16. Feed Roller
17. Manual Feed Table
18. Pick-up Roller
19. Separation Roller
20. Relay Rollers
21. Semi-circular Feed Rollers
22. Registration Rollers
23. Pre-transfer Lamp (PTL)
24. Transfer and Separation Corona Unit
25. Pick-off Pawls
26. Cleaning Brush
27. Cleaning Blade
28. Pressure Roller
29. Hot Roller
30. Duplex Turn Guide (Option)
31. Exit Rollers
32. Hot Roller Strippers
33. Exhaust Blower

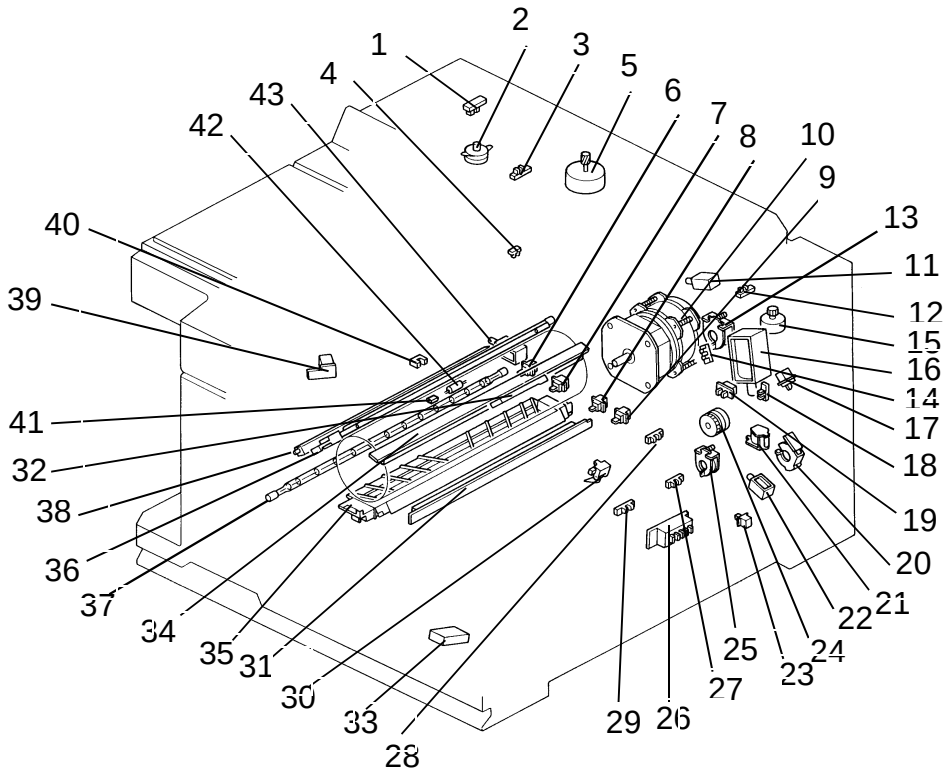
6. DRIVE LAYOUT



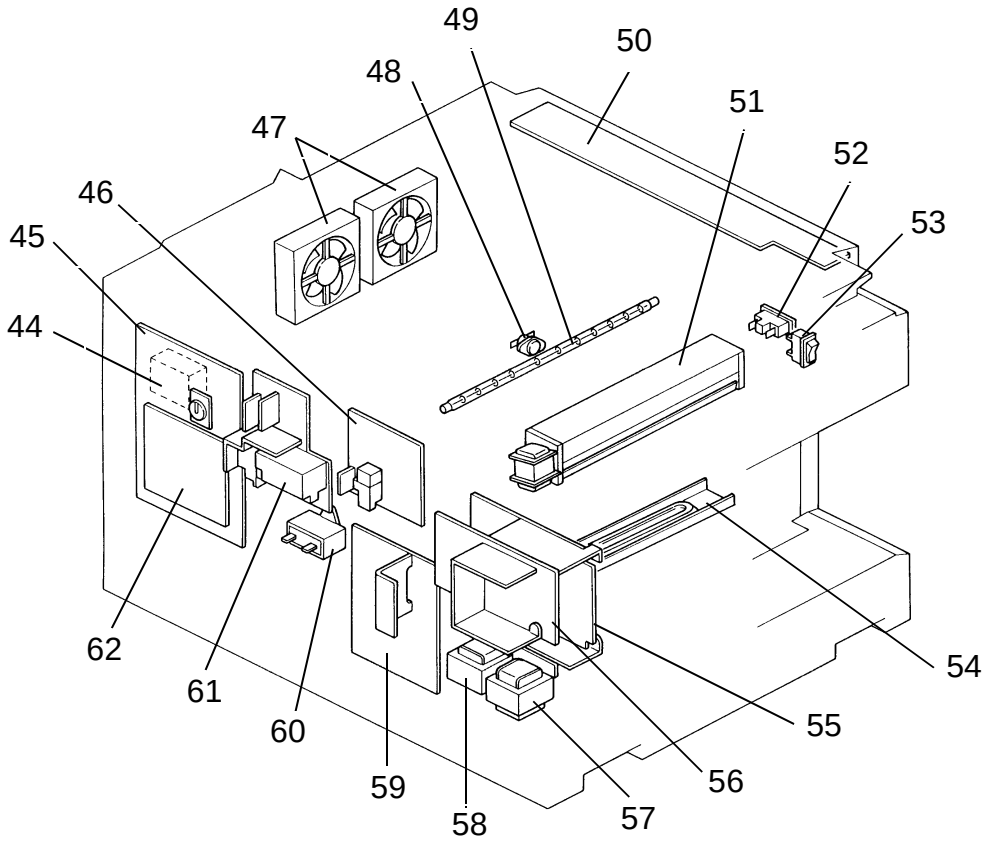



A
Paper Feed Section
BP3: Timing Belt Pulley
G11: Registration CL Gear
G4: Relay Gear
2nd Feed Station
Registration CL
G5: Relay Gear
G12: Relay Roller CL Gear
Registration Roller
1st Paper Feed CL
G6: 1st Paper Feed CL Gear
Relay Roller CL
1st Paper Feed CL
G7: Relay Gear
Relay Roller
G13: Relay Roller Gear
1st Paper Feed Rollers
G8: Paper Lift CL Gear
G14: Relay Gear
G15: 2nd Paper Feed CL Gear
Paper Lift CL
G9: Paper Lift Gear
2nd Paper Feed CL
G10: Sector Gear
2nd Paper Feed Roller

7. ELECTRICAL COMPONENT LAYOUT



1. Scanner H.P. Sensor
2. Lens Motor
3. Lens H.P. Sensor
4. Exit Sensor
5. Scanner Motor
6. 2nd Paper Size SW-1 (SW4)
7. 2nd Paper Size SW-2 (SW5)
8. 2nd Paper Size SW-3 (SW6)
9. 2nd Paper Size SW-4 (SW7)
10. Main Motor
11. Development CL Sol.
12. 4th/5th Mirror H.P. Sensor
13. Toner Supply CL Sol.
14. Toner End Sensor
15. 4th/5th Mirror Motor
16. Pick-up Roller Release Sol.
17. Manual Feed Table SW
18. Development Unit Set Sensor
19. Color Switch
20. Paper Lift CL Sol.
21. 1st Paper Feed CL Sol.
22. Relay Roller CL Sol.
23. Right Cover SW
24. Registration Clutch
25. 2nd Paper Feed CL Sol.
26. 1st Paper Size SW
27. 1st Paper End Sensor
28. 2nd Paper End Sensor
29. Cassette Lift Sensor
30. Registration Sensor
31. Pre-transfer Lamp (PTL)
32. ID Sensor
33. Total Counter
34. Erase Lamp (EL)
35. Transfer and Separation Corona Unit
36. Charge Corona Unit
37. Fusing Lamp
38. Quenching Lamp (QL)
39. Auto ID Sensor
40. Toner Overflow Sensor
41. Fusing Thermistor
42. Fusing Thermofuse
43. Tray Lock Sol.



44. Key Counter (Option)
45. Main Board
46. CC/Grid/Bias Power Pack
47. Optics Cooling Fan Motors
48. Optics Thermoswitch
49. Exposure Lamp
50. Operation Panel Board
51. Exhaust Blower Motor
52. Cover Safety SW
53. Main SW
54. Drum Anti-condensation Heater
55. Main DC Power Supply Board
56. Optional DC Power Supply Board (Option)
57. Optional Transformer (Option)
58. Main Transformer
59. AC Drive Board
60. Main Motor Capacitor
61. TC/SC Power Pack
62. Interface Board (Option)

8. ELECTRICAL COMPONENT DESCRIPTIONS

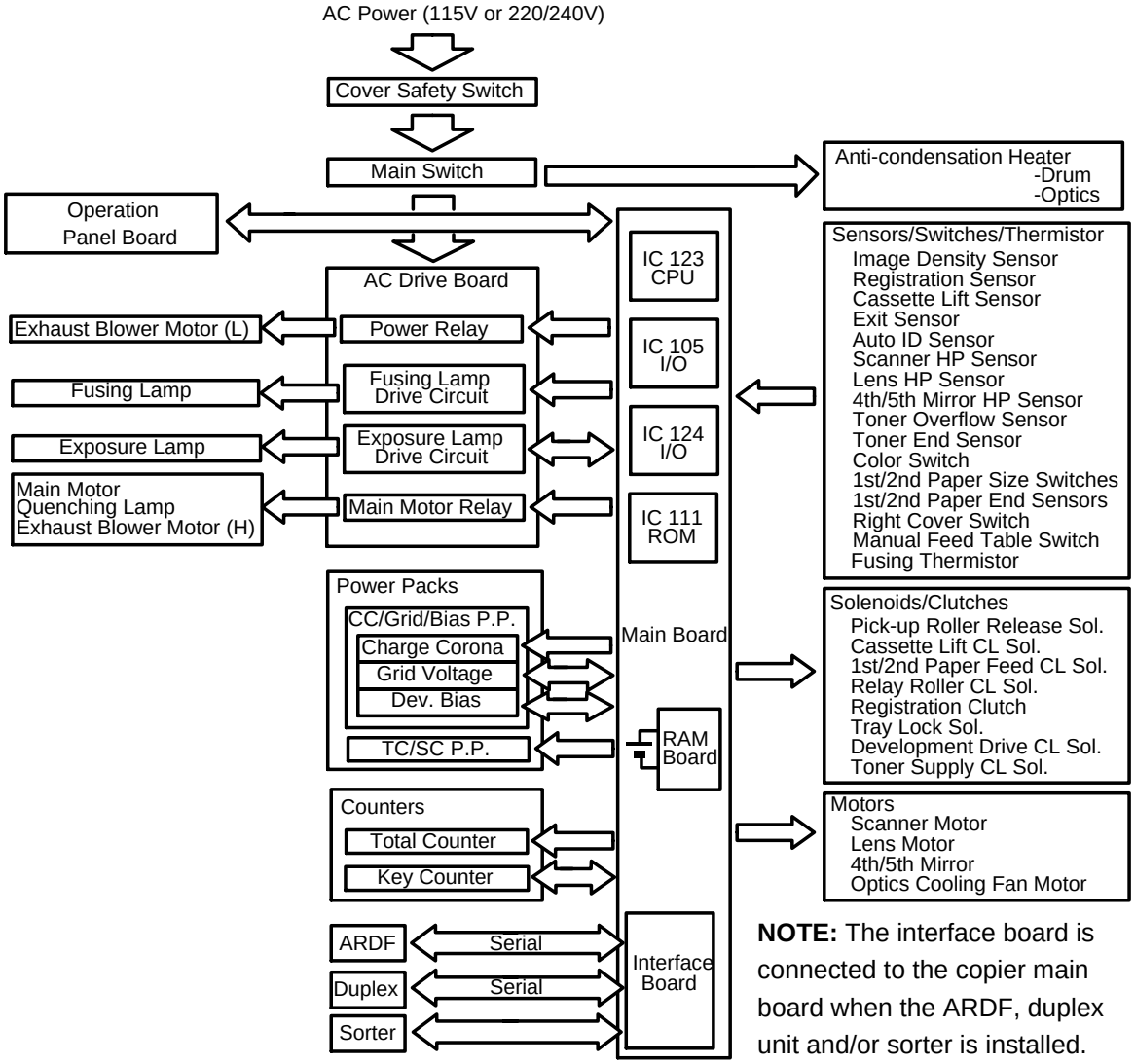
SYMBOL	NAME	FUNCTION	INDEX NO.
Motors			
M1	Main Motor	Drives all the main unit components except for the optics unit and fans. (115/220/240Vac)	10
M2	Scanner Motor	Drives the scanners (1st and 2nd). (dc stepper)	5
M3	Lens Motor	Moves the lens position according to the selected magnification. (dc stepper)	2
M4	4th/5th Mirror Motor	Move the 4th/5th mirror position according to the selected magnification. (dc stepper)	15
M5	Optics Cooling Fan Motor-1	Prevents built up of hot air in the optics cavity. (24 Vdc)	47
M6	Optics Cooling Fan Motor-2	Prevents built up of hot air in the optics cavity. (24 Vdc)	47
M7	Exhaust Blower Motor	Removes heat from around the fusing unit and blower the ozone built up around the charge section to the ozone filter.	51
Magnetic Clutch			
MC1	Registration Clutch	Drives the registration roller.	24
Solenoid			
SOL1	Toner Supply Clutch Solenoid	Drives the toner supply roller via the toner supply spring clutch.	13
SOL2	1st Paper Feed Clutch Solenoid	Starts paper feed from the first paper station.	21
SOL3	2nd Paper Feed Clutch Solenoid	Starts paper feed from the 2nd paper station.	25
SOL4	Pick-up Roller Release Solenoid	a) After the paper is fed, releases the pick-up roller from next paper. b) When the manual feed table is used, releases the pick-up roller from the table.	16
SOL5	Paper Lift Clutch Solenoid	Lifts paper to the appropriate feed position.	20
SOL6	Tray Lock Solenoid	Locks the paper tray/duplex unit.	43
SOL7	Development Clutch Solenoid	Drives the development unit.	11
SOL8	Relay Roller Clutch Solenoid	Drives the relay roller for the 2nd cassette station.	22

SYMBOL	NAME	FUNCTION	INDEX NO.
Switches			
SW1	Main Switch	Supplies power to the copier.	53
SW2	Cover Safety Switch	Cuts the ac power line.	52
SW3	1st Paper Size Switch	Determines what size paper is in the first cassette.	26
SW4	2nd Paper Size Switch-1	Determines what size paper is in the paper tray.	6
SW5	2nd Paper Size Switch-2	Determines what size paper is in the paper tray.	7
SW6	2nd Paper Size Switch-3	Determines what size paper is in the paper tray.	8
SW7	2nd Paper Size Switch-4	Determines what size paper is in the paper tray.	9
SW8	Color Switch	Determines which color development unit is installed.	19
SW9	Manual Feed Table Switch	Detects when the manual feed table is open.	17
SW10	Right Cover Switch	Detects when the right cover is open.	23
Sensor			
S1	Scanner Home Position Sensor	Informs the CPU when the 1st scanner is at the home position.	1
S2	Lens Home Position Sensor	Informs the CPU when the lens is at the home position (full size position).	3
S3	4th/5th Mirror Home Position Sensor	Informs the CPU when the 3rd scanner (4th/5th mirrors assembly) is at the home position (full size position).	12
S4	Registration Sensor	Detects misfeeds.	30
S5	Exit Sensor	Detects misfeeds.	4
S6	1st Paper End Sensor	Informs CPU when the first cassette runs out of paper.	27
S7	2nd Paper End Sensor	Informs CPU when the paper tray runs out of paper.	28
S8	Toner End Sensor	Detects when it is time to add toner.	18
S9	Toner Overflow Sensor	Detects when the used toner tank is full.	40
S10	Paper Lift Sensor	Detects the correct feed height of the cassette.	29

SYMBOL	NAME	FUNCTION	INDEX NO.
S11	Image Density (ID) Sensor	Detects the density of the image on the drum to control the toner density.	32
S12	Development Unit Set Sensor	Sensors whether or not the development unit is properly set.	18
Printed Circuit Board			
PCB1	Main Board	Controls all copier functions both directly and through the other PCBs.	45
PCB2	AC Drive Board	Drives all ac motors, the exposure lamp, fusing lamp, quenching lamp, exhaust blower motor.	59
PCB3	Main DC Power Supply Board	Rectifies 26 and 10 Vac input and outputs dc voltages.	55
PCB4	Auto Image Density Sensor (ADS)	Senses the background density of the original.	39
PCB5	Optional DC Power Supply Board	Rectifies 26 and 10 Vac input and outputs dc voltasges.	56
PCB6	Interface Board	Interfaces between the copier main board and all the optional equipment's main board.	62
PCB7	Operation Panel Board	Informs the CPU of the selected modes and displays the situations on the panel.	50
Lamps			
L1	Exposure Lamp	Applies high intensity light to the original for exposure.	49
L2	Fusing Lamp	Provides heat to the hot roller.	37
L3	Quenching Lamp	Neutralizes any charge remaining on the drum surface after cleaning.	38
L4	Erase Lamp	Discharge the drum outside of the image area. Provides leading/trailing edge erase.	34
L5	Pre-transfer Lamp	Reduces charge on the drum surface before transfer.	31
Power Packs			
P1	CC/Grid/Bias Power Pack	Provides high voltage for the charge corona, grid, and the development roller bias.	46
P2	TC/SC Power Pack	Provides high voltage for the transfer and separation corona.	61

SYMBOL	NAME	FUNCTION	INDEX NO.
Heaters			
H1	Drum Anti-condensation Heater	Prevents moisture around the drum.	54
H2	Optics Anti-condensation Heater Option	Prevents moisture from forming on the optics.	N/A
Counters			
CO1	Total Counter	Keeps track of the total number of copies made.	33
CO2	Key Counter (Option)	Used for control of authorized use. Copier will not operate until installed.	44
Transformer			
TR1	Main Transformer	Steps down the wall voltage to 26 Vac and 10 Vac.	58
TR2	Optional Transformer	Steps down the wall voltage to 26 Vac and 10 Vac for the document feeder and duplex unit.	57
Others			
TH	Fusing Thermistor	Monitors the fusing temperature.	41
TF	Fusing Thermofuse	Provides back-up overheat protection in the fusing unit.	42
TS	Optics Thermoswitch	Provides back-up overheat protection around the exposure lamp.	48
C	Main Motor Capacitor	Start capacitor	60

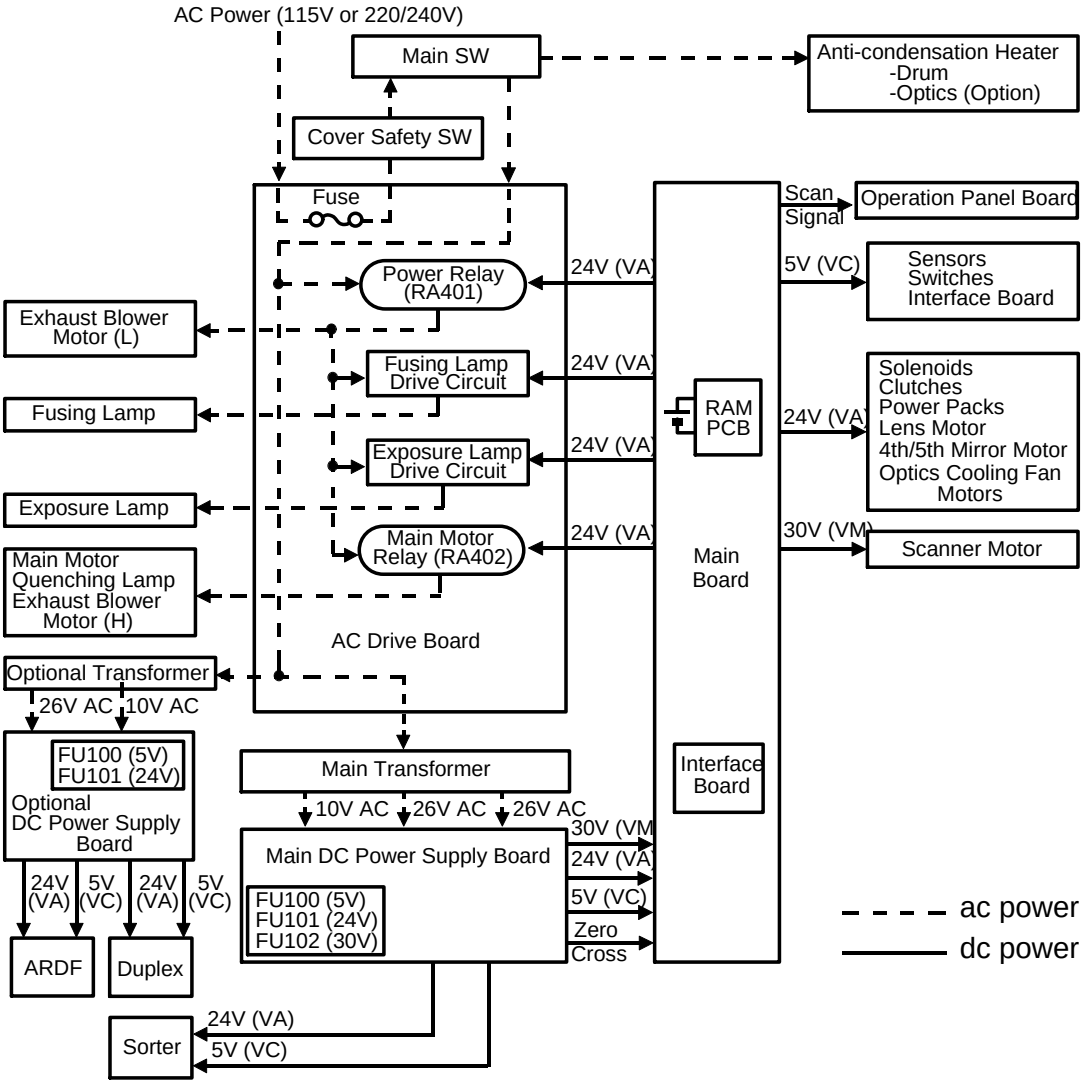
9. OVERALL MACHINE CONTROL



NOTE: The interface board is connected to the copier main board when the ARDF, duplex unit and/or sorter is installed.

The above diagram shows the control system of this copier in block form. The CPU (IC123) on the main board controls the timing of all copier's operation based on the CPU's internal clock. The CPU monitors the input signals from all sensors and controls the dc components directly or through two I/O chips (IC 105 and IC 124). It also controls ac components such as the fusing lamp, exposure lamp, main motor quenching lamp, and exhaust blower motor (High speed) directly via the ac drive board. The exhaust blower motor (Low speed) is controlled via the I/O chip (IC 124) and ac drive board. The charge corona, grid voltage and development bias are powered by the same power pack (P1) but are controlled separately as shown above. The main board has a RAM board for the service program mode and misfeed recovery. A battery backs up the power to the RAM board.

10. AC POWER AND DC POWER DISTRIBUTION



When this copier is plugged in and the main switch is turned off, ac power is supplied via the ac drive board to the anti-condensation heater. When the front cover and/or the exit cover is open, the cover safety switch completely cuts off power to all ac and dc components. The RAM board has a back up power supply (dc battery) for the service program mode and misfeed job recovery.

When the main switch is turned on, the ac power supply to the anti-condensation heater is cut off and ac power is supplied to the ac drive board. The main transformer receives wall outlet ac power through the ac drive board and outputs 10 volts ac and 26 volts ac to the main dc power supply board.

The main dc power supply board converts the 10 volts ac input to +5 volts and a zero cross signal. There are two 26 volts ac inputs. The dc power supply board converts them to +24 volts and +30 volts.

The +5 volts and +24 volts are supplied to both the copier main board and the sorter main board. The zero cross signal and +30 volts are supplied to the copier main board.

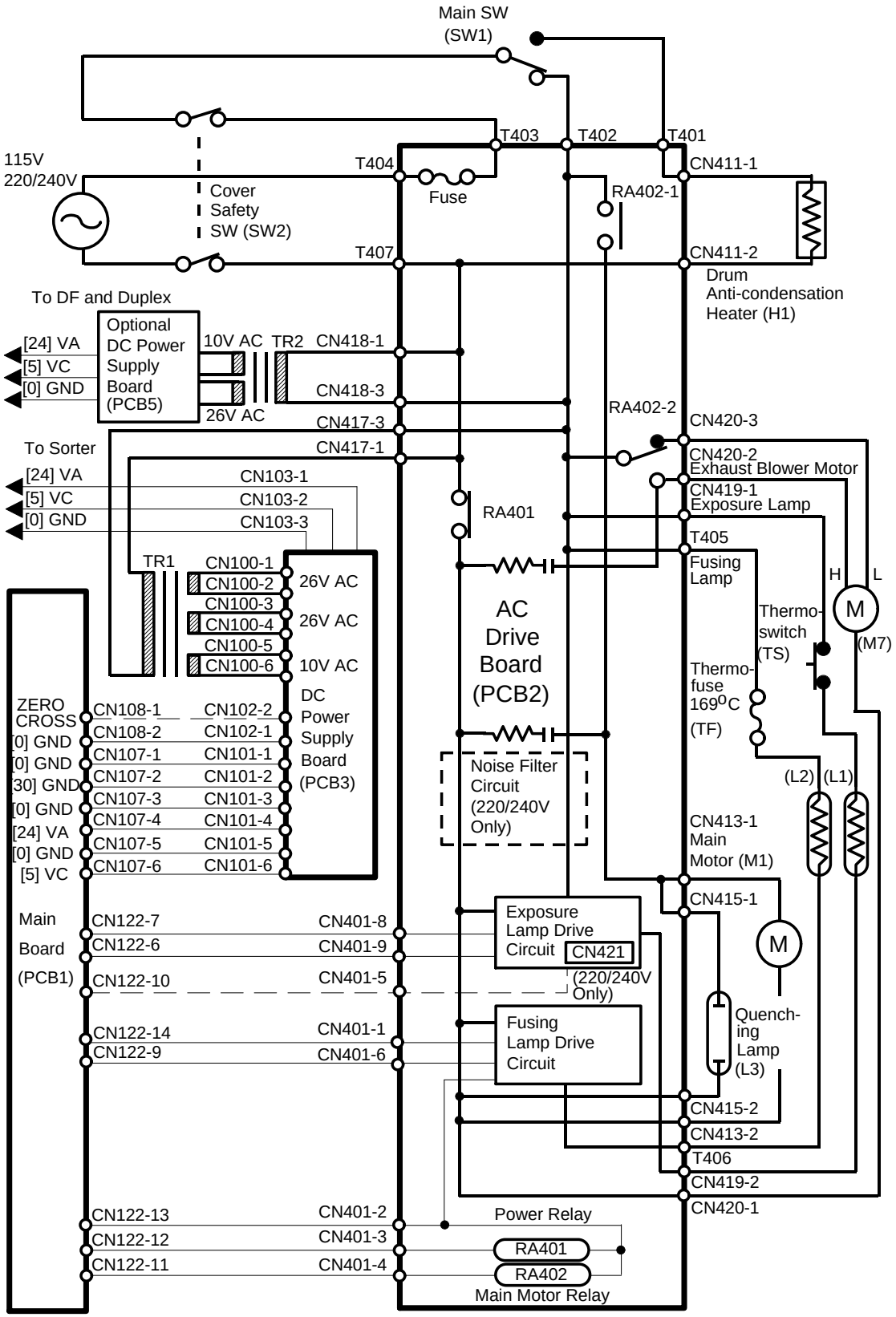
The copier main board supplies dc powers to all copier dc components. All sensors, and switches plus the interface board operate on +5 volts. The scanner motor operates on +30 volts. All other dc components including the power relay (RA401) and the main motor relay (RA402) operate on +24 volts. The ARDF and the duplex unit have a separate dc power supply.

When the main board receives power, it activates the power relay (RA401) which then supplies ac power to the fusing lamp drive circuit, and the exposure lamp drive circuit on the ac drive board. The exhaust blower motor begins rotating at low speed. The fusing lamp drive circuit receives a trigger signal from the main board and the fusing lamp lights. The exposure lamp does not turn on until the main board send a trigger pulse to the exposure lamp drive circuit.

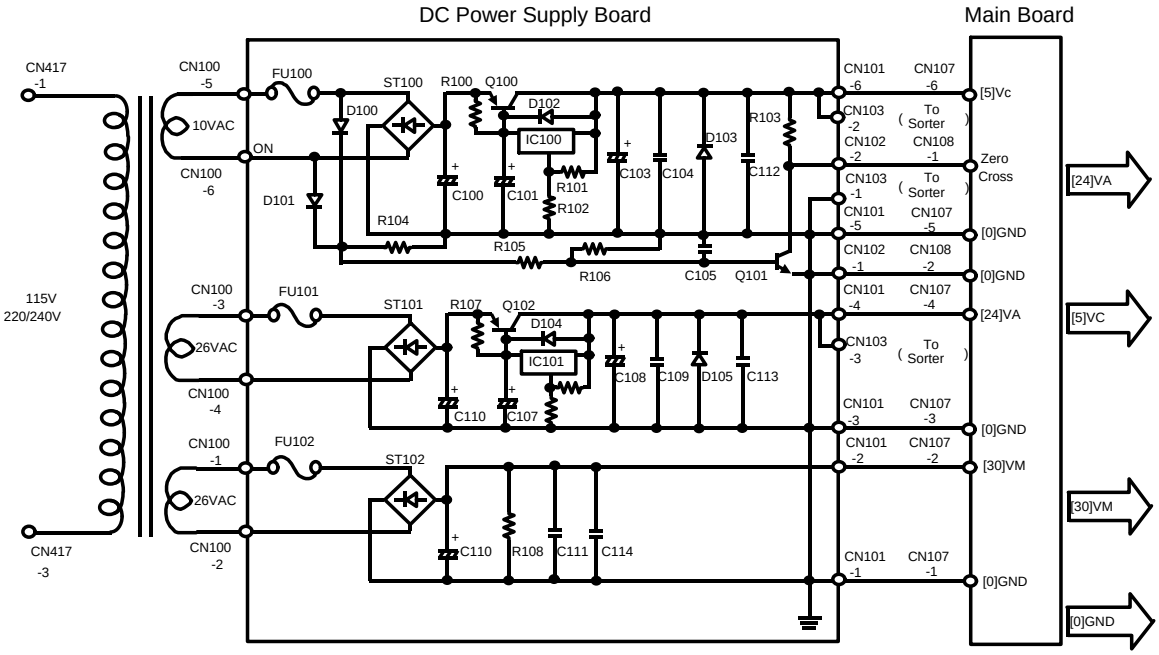
When the Start key is pressed, the main board energizes the main motor relay (RA402). Then, the main motor and the quenching lamp turn on and the exhaust blower starts rotating at high speed.

When the main switch is turned off, power is cut off to the main board and to RA401, and the drum and optional anticondensation heaters are turned on. The exposure lamp and the fusing lamp power lines are completely disconnected from the line voltage.

10.1 AC POWER DISTRIBUTION



10.2 DC POWER DISTRIBUTION



SECTION 2

SECTIONAL DESCRIPTION

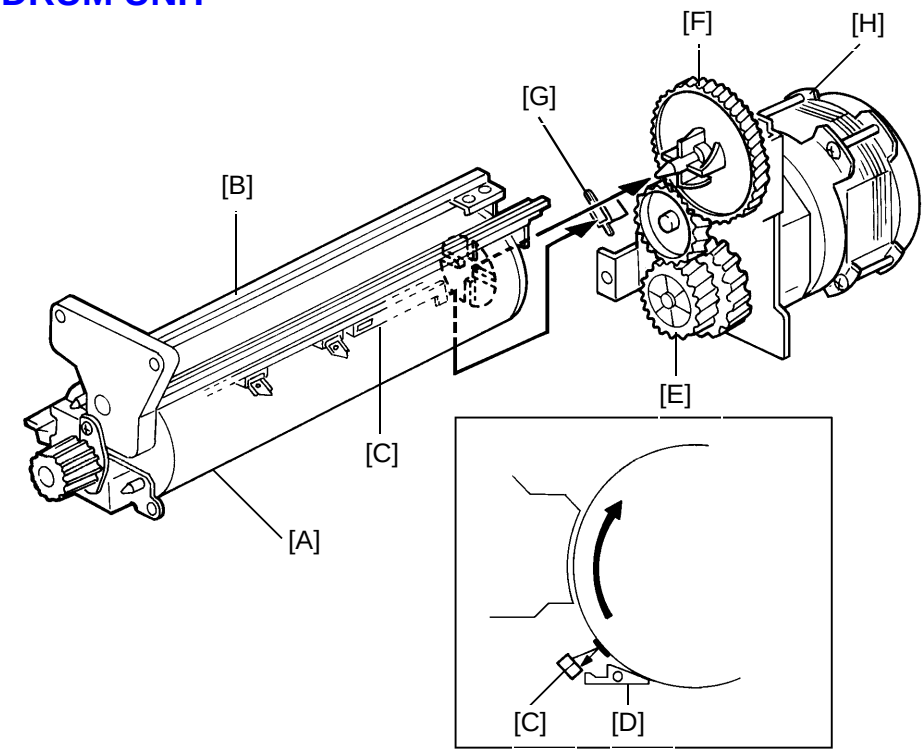
1. DRUM

1.1 OPC DRUM CHARACTERISTICS

An OPC has the characteristics of:

1. Being able to accept a high negative electrical charge in the dark. (The electrical resistance of a photoconductor is high in the absence of light.)
2. Dissipating the electrical charge when exposed to light. (Exposure to light greatly increases the conductivity of a photoconductor.)
3. Dissipating an amount of charge in direct proportion to the intensity of the light. That is, where stronger light is directed to the photoconductor surface, a smaller voltage remains on the OPC.
4. Being less sensitive to changes in temperature (when compared to selenium F type drums). This makes it unnecessary to monitor and control the drum temperature.

1.2 DRUM UNIT



An organic photoconductor drum [A] is used on this model.

A drum unit [B] is used to hold the drum to prevent stress on the drum. The drum unit consists of an OPC drum, ID sensor [C] and pick-off pawls [D]. When the drum is replaced, and/or the pick-off pawls and/or the ID sensor are cleaned, the drum unit must be removed from the copier as a unit.

The drum is driven by the main motor [H] through the main motor gear [E], a relay gear and the drum drive gear [F]. The pick-off pawls [D] are always in contact with the drum surface. The ID sensor is electrically connected to the ID sensor connector [G].

1.3 HANDLING THE DRUM

The organic photoconductor drum is comparatively more sensitive to light and ammonia gas than a selenium drum.

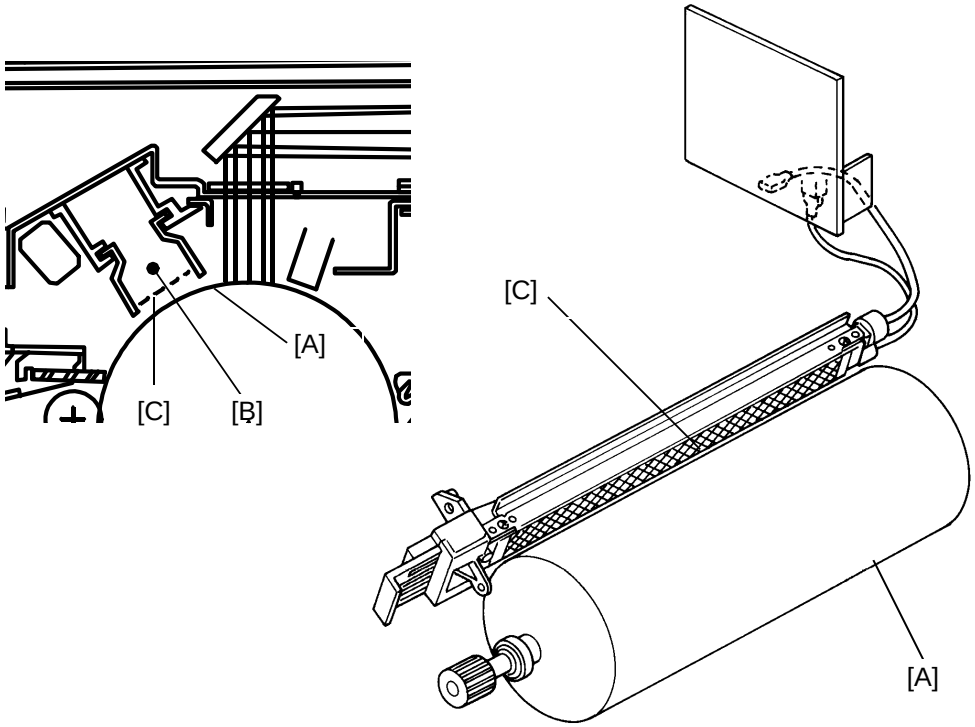
1. Never expose the drum to direct sunlight.
2. Never expose the drum to direct light of more than 1,000 Lux for more than a minute.
3. Never touch the drum surface with bare hands. When the drum surface is touched with a finger or becomes dirty, wipe with a dry cloth or clean with wet cotton. Wipe with a dry cloth after cleaning with wet cotton.
4. Never use alcohol to clean the drum; alcohol dissolves the drum surface.
5. Store the drum in a cool, dry place away from heat.
6. Take care not to scratch the drum as the drum layer is thin and is easily damaged.
7. Never expose the drum to corrosive gases such as ammonia gas.
8. Always keep the drum in the protective sheet when inserting or pulling the drum unit out of the copier to avoid exposing it to bright light or direct sunlight. This will protect the drum from light fatigue.
9. Before inserting or pulling out the drum unit, the following should be performed to avoid damaging the drum:
    a) Remove the cleaning unit.
    b) Remove the development unit.
    c) Remove the charge corona unit.
    d) Release the transport unit.
10. Before pulling out the drum unit, place a sheet of paper under the drum to catch any dropped toner.
11. Drum initial setting (SP #66) must be performed when a new drum is installed.

NOTE: This is not necessary at installation of a new machine as the drum initial setting is performed at the factory.

12. Dispose of the used drum according to local regulations.

2. DRUM CHARGE

2.1 OVERVIEW



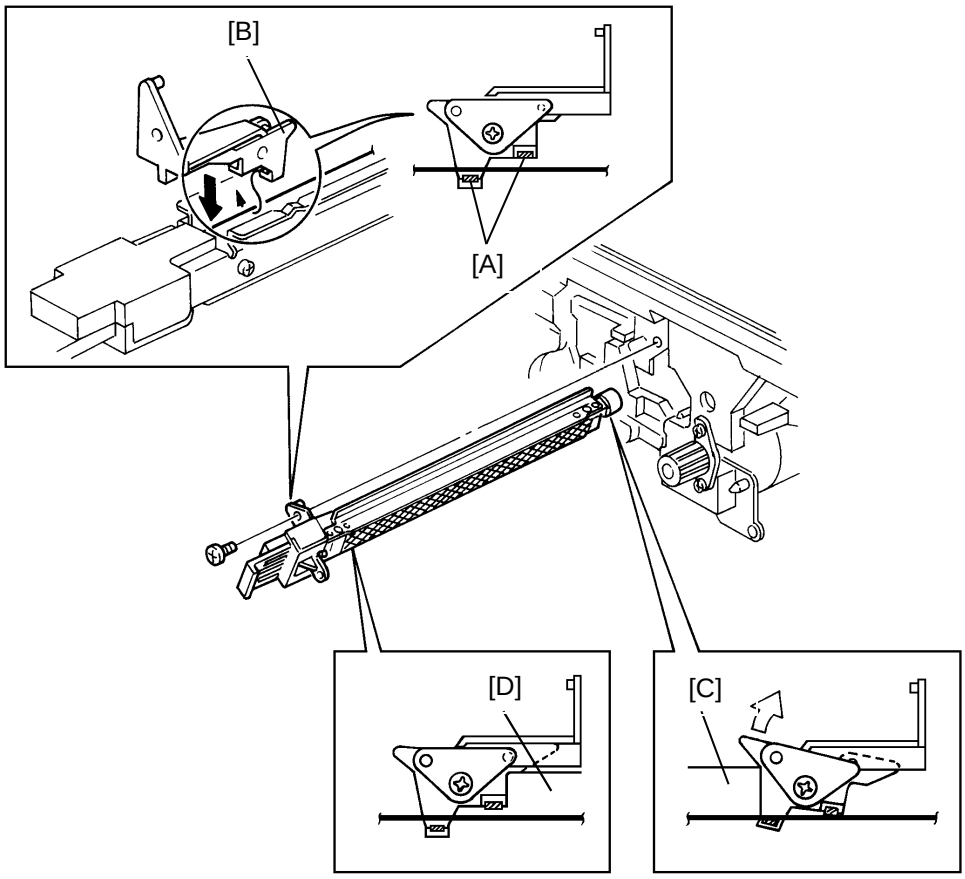
This copier uses a single wire scorotron and a highly sensitive OPC drum [A]. The corona wire [B] generates a corona of negative ions when the CC/B/G power pack applies a high voltage. A stainless steel grid plate [C] makes the corona charge uniform. The drum coating receives a uniform negative charge as it rotates past the corona unit.

The exhaust blower, located above the copy exit, causes a flow of air from the upper area of the development unit through the charge corona unit. This prevents uneven build-up of negative ions that can cause uneven image density. The exhaust blower runs at half speed when in the stand-by condition and runs at full speed while copying.

The exhaust blower has an ozone filter (active carbons) which adsorbs ozone (O_3) generated by the corona discharge. The ozone filter decreases in efficiency over time as it adsorbs ozone. The ozone filter should be replaced at every 60,000 copies.

The flow of air around the charge corona wire may deposit paper dust or toner particles on the corona wire. These particles may interfere with charging and cause low density bands on copies. The wire cleaner cleans the corona wire when the operator slides the corona unit in and out.

2.2 CHARGE CORONA WIRE CLEANER MECHANISM



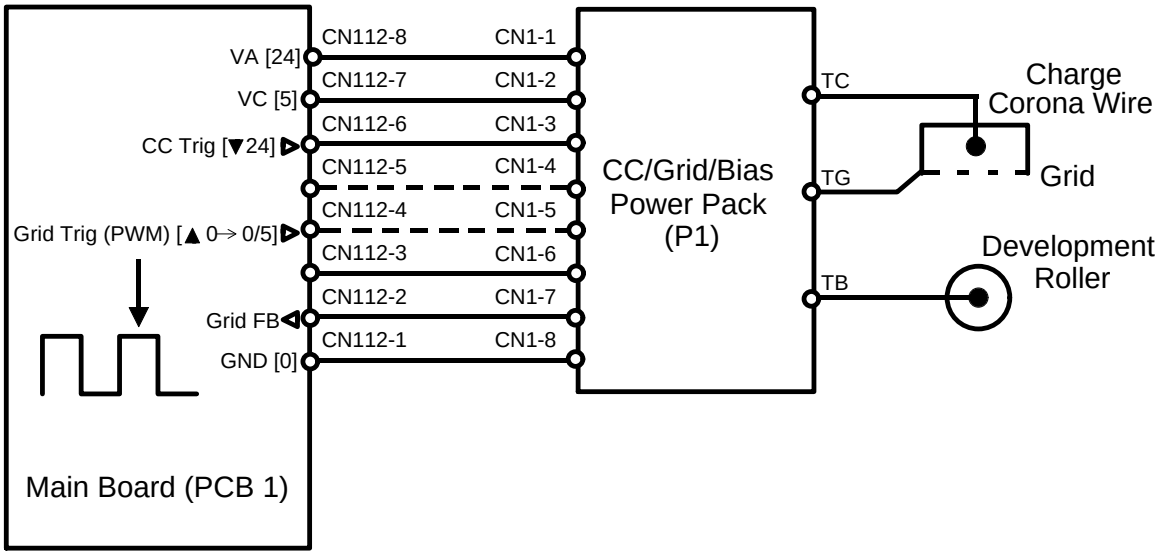
Pads [A] above and below the charge corona wire clean the wire as the charge unit is manually slid in and out.

The cleaner pad bracket [B] rotates when the charge unit is fully extended and the bracket is pulled up against the rear block [C]. This moves the pads against the corona wire (see illustration). If the charge unit is not fully extended, the pads do not touch the corona wire.

The pads move away from the wire when the charge unit is fully inserted and the cleaning bracket is pushed against the front block [D].

After copier installation the key operator should be instructed how to use this mechanism when copies have white streaks.

2.3 CHARGE CORONA CIRCUIT



The main board supplies +24 volts to the CC/Grid/Bias power pack at CN1-1 as the power supply source. About 0.44 seconds after the Start key is pressed, the CPU drops CN1-3 from +24 volts to 0 volts. This energizes the charge corona circuit within the CC/Grid/Bias power pack, which applies a high negative voltage of approximately –5.6 kv to the charge corona wire. The corona wire then generates a negative corona charge.

The grid limits the charge voltage to ensure that the charge does not fluctuate and an even charge is applied to the drum surface.

The grid trigger pulse applied to CN1-5 is a pulse width modulated signal (PWM signal). This signal is not only a trigger signal; it also changes the voltage level of the grid. As the width of the pulse applied increases, the voltage of the grid also increases. The CPU monitors the grid voltage at CN1-7 and controls the width of the grid trigger pulses based on this feedback.

2.4 GRID VOLTAGE CORRECTION

There are two grid voltage correction factors. These correct for increases in the drum residual voltage (Vr). The first such factor, Vr correction, is done every 1,000 copies. Vr correction is based on the data of the drum counter (SP #69) and the Vr correction ratio (L) (SP #67). The second factor, Vp correction, corrects for changes in the photoconductor's chargeability. (The chargeability of a new OPC drum may change after installation, but this stabilizes at around 2,000 copies.) Vp correction is based on the drum counter. The counter resets to "0" when drum initial setting (SP mode #66) is performed.

Both correction factors are applied to the copy process as follows:

1. Image area

Grid Voltage = –920 volts
+
Vr Correction Factor.

Vr Correction Factor

L	Change of Grid Voltage
100 to 89 (%)	±0 (volts)
88 to 76 (%)	–40 (volts)
75 to 62 (%)	–80 (volts)
61 to 45 (%)	–120 (volts)
44 to 0 (%)	–160 (volts)

L = Vrp/Vsg x 100 (Vr correction ratio)
Vrp: ID sensor output for Vr correction pattern
Vsg: ID sensor output for bare drum

2. Non-image area

Grid Voltage = 0 volts (Fixed)

3. ID sensor pattern area

Grid Voltage = –620 volts
+
Vp Correction Factor

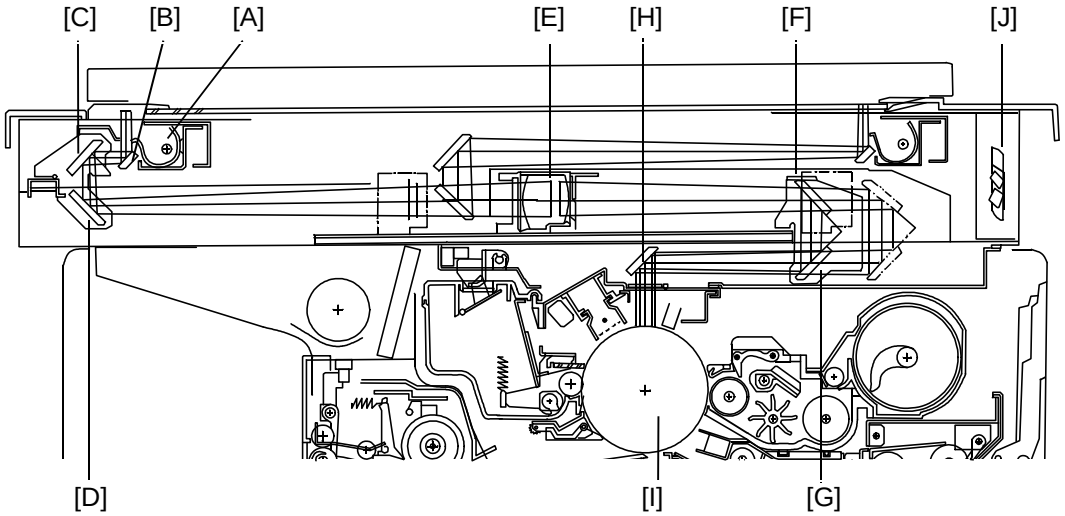
Drum Counter	Vp Correction Factor	
	Black	Color
0 to 999 (copies)	±0 (volts)	±0 (volts)
1,000 to 1,999 (copies)	–20 (volts)	±0 (volts)
Over 2,000 (copies)	–40 (volts)	–20 (volts)

4. Vr correction pattern area

Grid Voltage = –500 volts (Fixed)

3. OPTICS

3.1 OVERVIEW



During the copy cycle, an image of the original is reflected onto the drum surface through the optics assembly as follows.

Light Path:

Exposure Lamp [A] → Original → First Mirror [B] → Second Mirror [C] → Third Mirror [D] → Lens [E] → Fourth Mirror [F] → Fifth Mirror [G] → Sixth Mirror [H] → Drum [I]

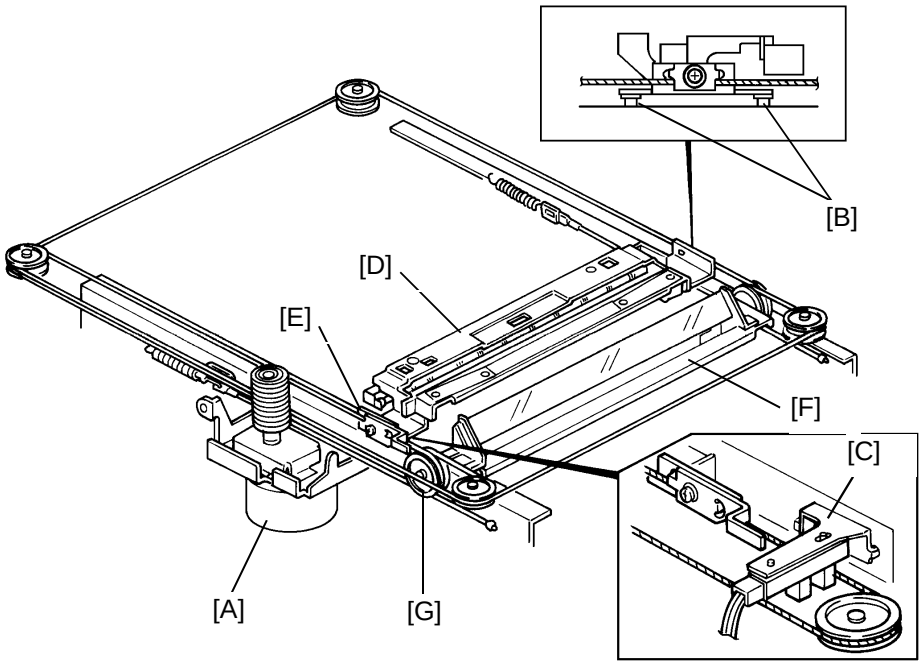
The two optics cooling fans [J] draw cool air into the optics cavity. The air flows from the right to the left in the optics cavity and exhausts through the vents in the left cover. These fans operate during the copy cycle.

This copier has six standard reproduction ratios: Three reduction ratios, two enlargement ratios, and full size. It also has a zoom function. The operator can change the reproduction ratio in one percent steps from 50% to 200%.

Stepper motors are used to change the positions of the lens and mirrors. Separate motors are used because the wide range of reproduction ratios makes it mechanically difficult for one motor to position both the lens and mirrors. A stepper motor is also used to drive the scanner. This motor changes the scanner speed according to the reproduction ratio.

The thermoswitch opens at 130 ^{o}C and removes ac power to the exposure lamp to prevent overheating. The thermoswitch can be reset manually when the exposure lamp area cools.

3.2 SCANNER DRIVE



3.2.1 1st and 2nd Scanner Drive Mechanism

This model uses a stepping motor [A] to drive the scanners. Both ends of each scanner are driven to prevent skewing. The scanners have sliders [B], which ride on guide rails.

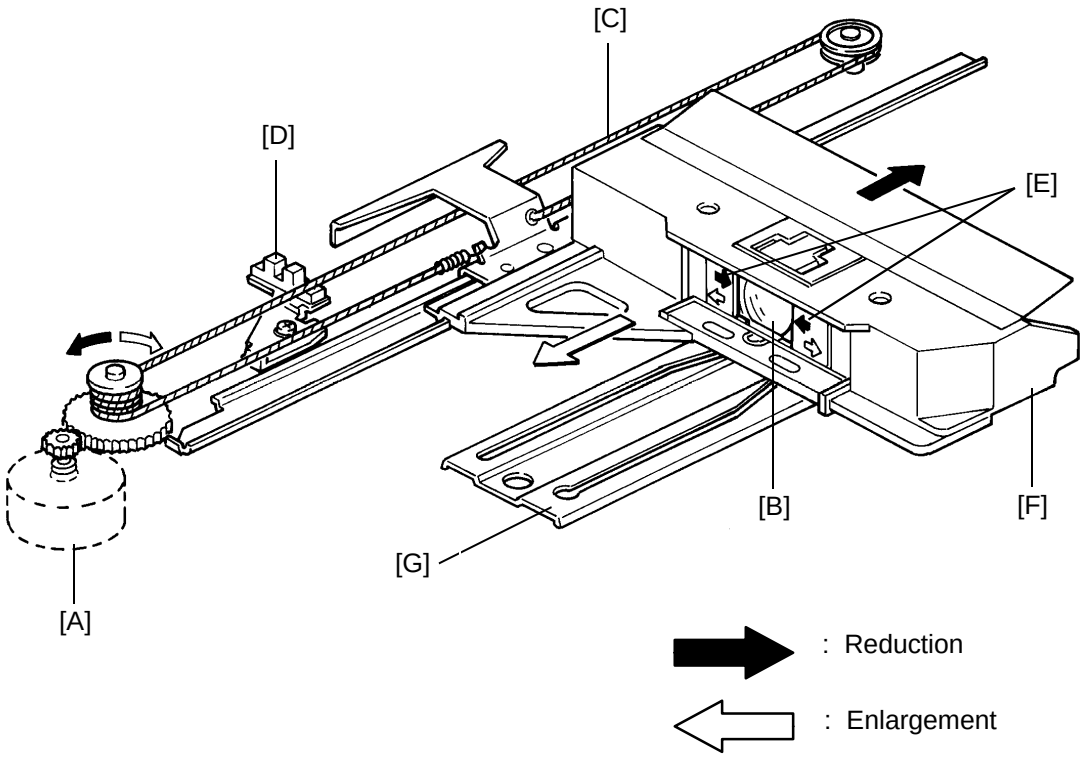
The scanner home position is detected by the home position sensor [C]. The scanner return position is determined by counting the scanner motor drive pulses.

The first scanner [D], which consists of the exposure lamp and the first mirror, is connected to the scanner drive wire by the wire clamps [E]. The second scanner [F], which consists of the second and third mirrors, is connected to the scanner drive wire by movable pulleys (the second scanner pulley [G]).

The pulley moves the second scanner at half the velocity of the first scanner. This is to maintain the focal distance between the original and the lens during scanning. This relationship can be expressed as:

V1r = 2 (V2r) = VD/r
where r = Reproduction ratio
V1r = First scanner velocity (when the reproduction ratio is "r")
V2r = Second scanner velocity (when the reproduction ratio is "r")
VD = Drum peripheral velocity (120 mm/s)

3.3 LENS DRIVE



3.3.1 Lens Drive

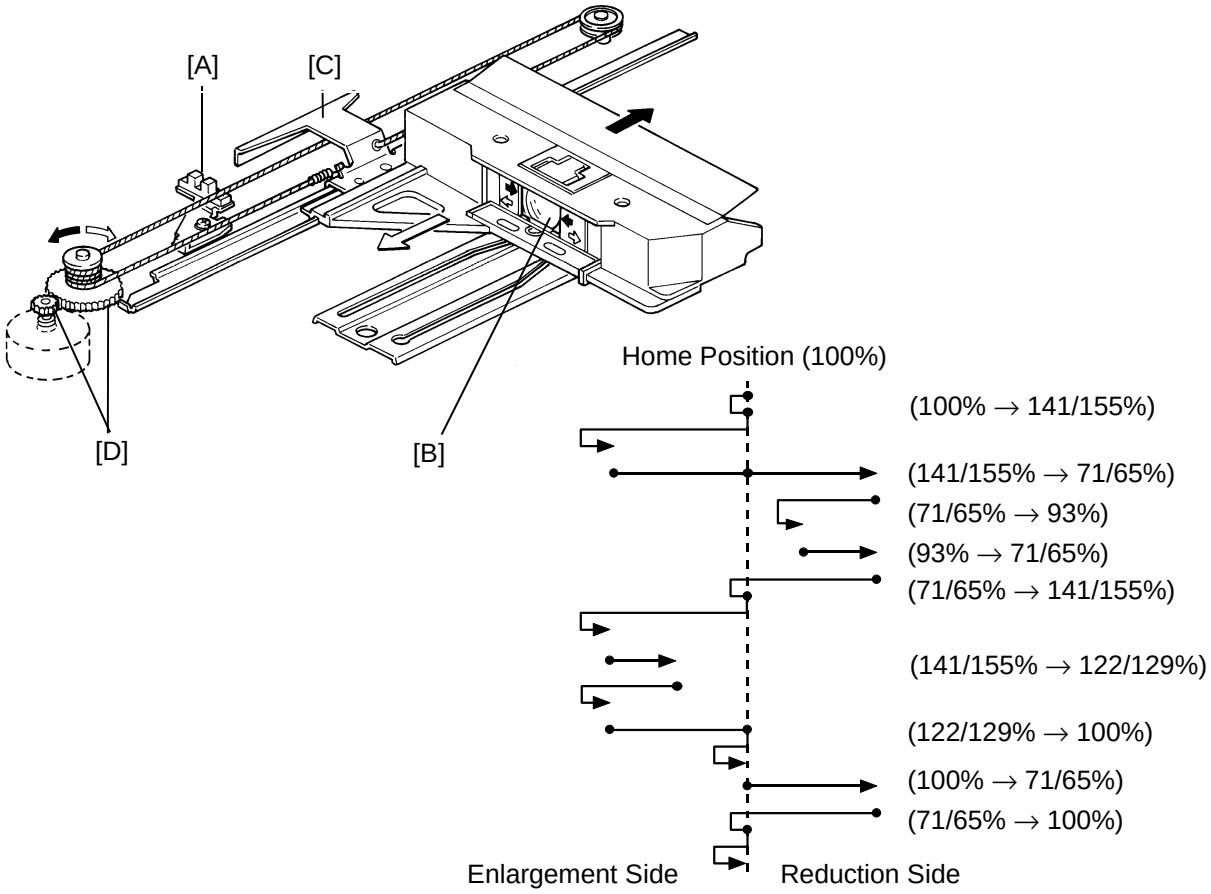
The lens motor [A] (stepper motor) changes the lens [B] position through the lens drive wire [C] in accordance with the selected reproduction ratio to provide the proper optical distance between the lens and the drum surface.

The rotation of the lens drive pulley moves the lens back and forth in discrete steps. The home position of the lens is detected by the home position sensor [D]. The main board keeps track of the lens position based on the number of pulses sent to the lens motor.

3.3.2 Shading Mechanism

The shading plates [E] are installed on the lens housing [F] and are slid open and shut by the shading cam [G]. This shading mechanism adjusts the horizontal light intensity, which becomes uneven in reduction mode, when the light at both edges is more intense. The shading plates close in reduction mode to even out the light intensity.

3.3.3 Lens Positioning



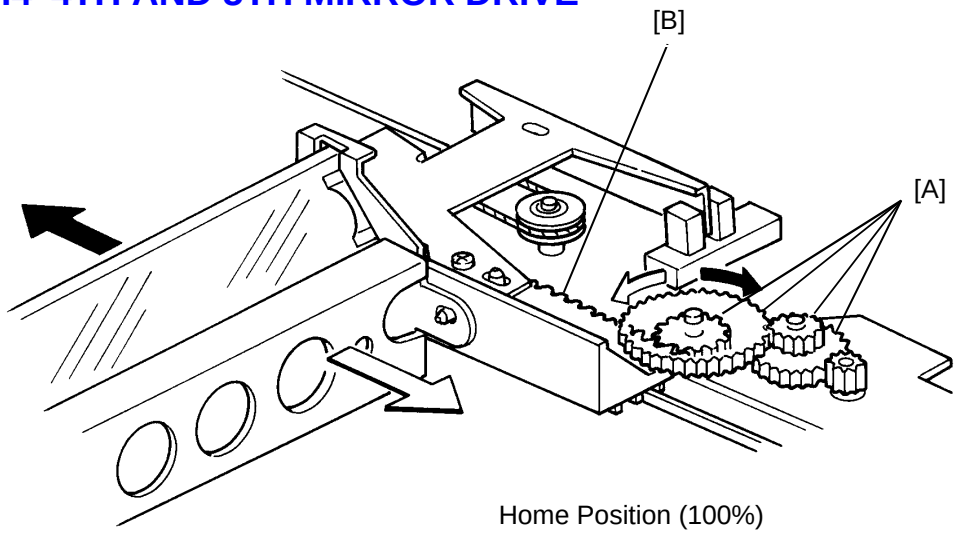
The lens home position sensor [A] informs the main board when the lens is at full size position (home position). The main board determines the lens stop position in reduction and enlargement modes by counting the number of steps the motor makes with reference to the lens home position. When a new reproduction ratio is selected, the lens [B] moves directly to the selected magnification position.

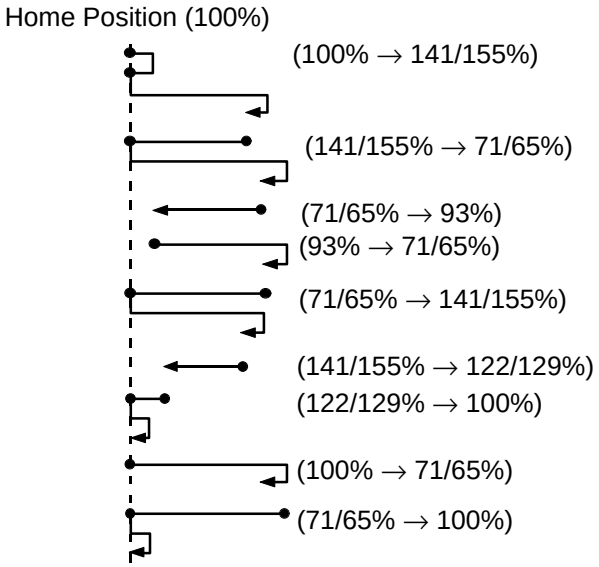
The lens home position is registered each time the lens starts from or passes through the lens home position sensor. As the lens moves from the enlargement side to the reduction side, the sensor registers the home position. This occurs when the actuator plate [C] enters the lens home position sensor.

A small vibration can be observed when the lens moves through home position from the reduction side to the enlargement side because the lens is going in the wrong direction to register the home position. The lens overshoots the home position by only one pulse before going back to register the home position.

The lens always stops while moving from left to right (as viewed from the front) to minimize the error caused by mechanical play in the drive gears [D].

3.4 4TH AND 5TH MIRROR DRIVE





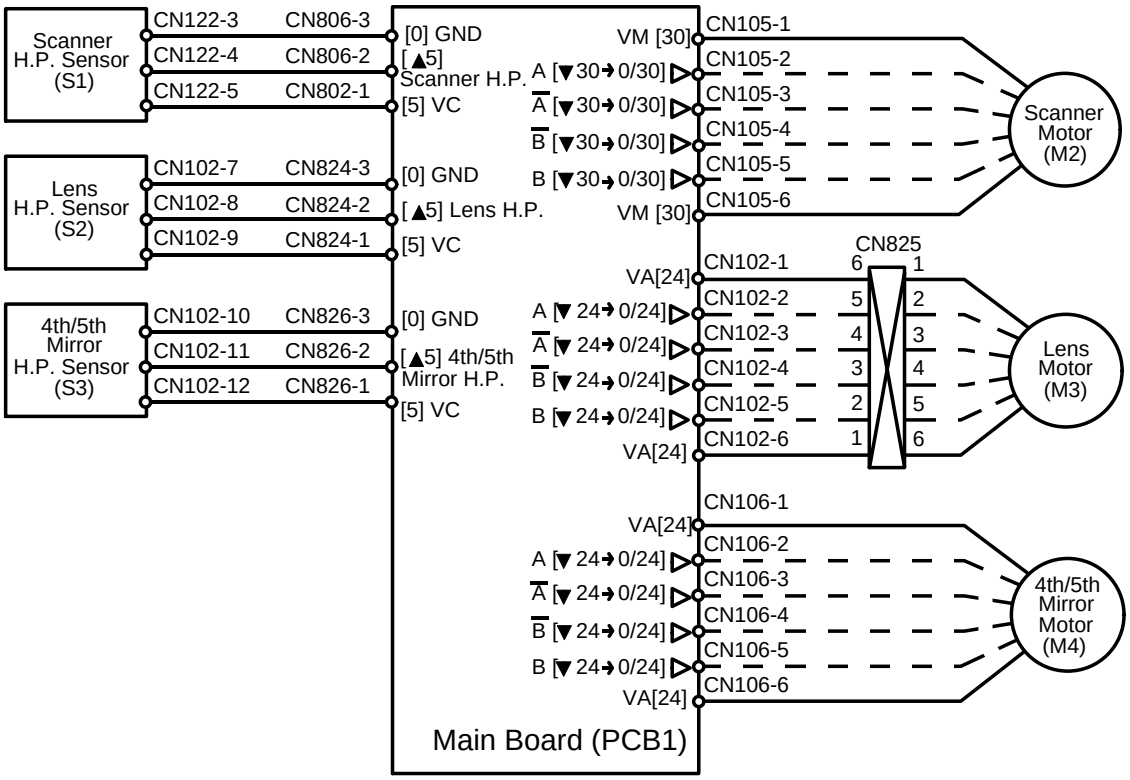
3.4.1 Drive

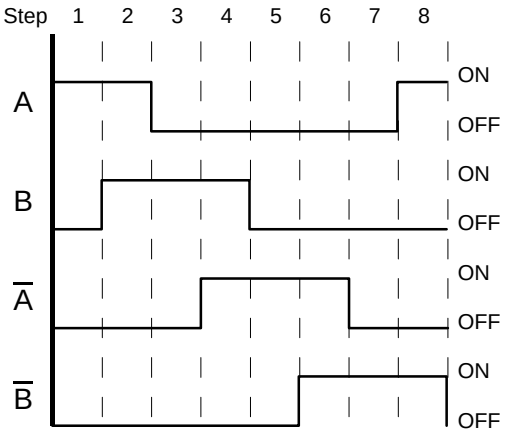
The 4th/5th mirror drive motor (stepper motor) changes the 4th/5th mirror assembly position through the pinion gears [A] and the rack gear [B] in accordance with the selected reproduction ratio to provide the proper optical distance between the lens and drum surface.

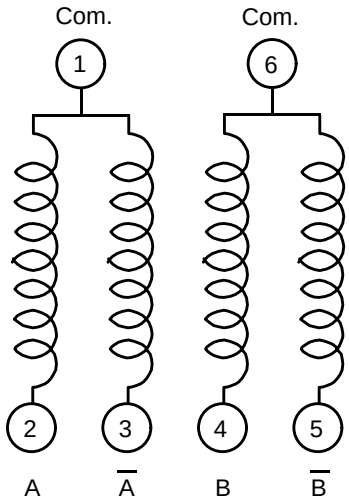
3.4.2 Positioning

The positioning mechanism is similar to that of lens positioning, as shown in the above positioning chart. The scanner always stops while moving from right to left (as viewed from the front).

3.5 STEPPER MOTOR CONTROL CIRCUIT





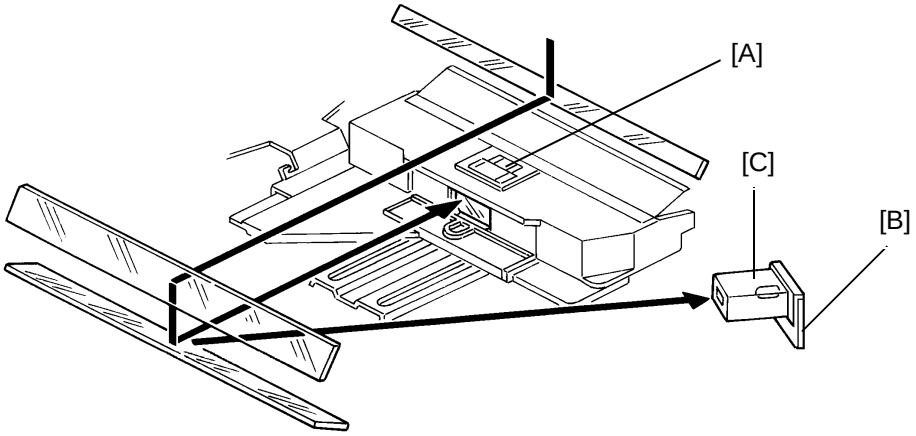


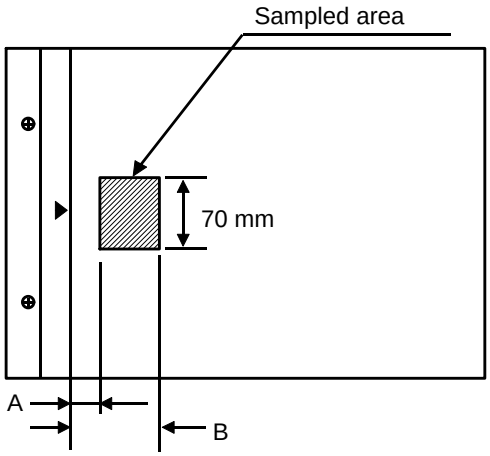
The scanner motor, the lens motor, and the 4th/5th mirror motor are all stepper motors. The scanner motor operates on +30 volts. Both the lens motor and the 4th/5th mirror motor operate on +24 volts. The stators of these stepper motors have four coils (labeled A, B, Ā, B̄ above), and the rotor is made of permanent magnets. Pulse signals energize the four coils as shown in the above illustration. The rotors of these motors turn in discrete steps, and 48 steps are required for one revolution.

The lens motor and the 4th/5th mirror motor move at a constant speed, but the scanner motor speed varies according to the reproduction ratio. The CPU changes the pulse rate (pulse per second) to adjust the speed for the selected reproduction ratio.

HP sensors inform the main board when the first scanner, lens, and 4th/5th mirror assembly reach their respective home positions. The main board determines the stop position by counting the number of steps the motor makes with reference to the home position.

3.6 AUTOMATIC IMAGE DENSITY DETECTION





Light from the exposure lamp is reflected from the original and travels to the lens [A] via the mirrors. The auto ID sensor [B], a photodiode, is mounted on the upper front frame. The sensor cover [C] has a hole in it to allow light to fall directly onto the sensor. Sampling starts 10 millimeters from the leading edge of the original and continued to 40 millimeters from the leading edge of original in full size mode.

The length A and B in each reproduction ratio are calculated as follows:

$$A = \frac{10\ \text{mm}}{\text{Reproduction Ratio (\%)}} \times 100 \qquad B = \frac{40\ \text{mm}}{\text{Reproduction Ratio (\%)}} \times 100$$

The photosensor circuit converts the light intensity to a voltage. The detected voltage is amplified and sent to the main PCB. The CPU stores the voltage of each sampled point in RAM. It then computes the image density of the original from the maximum sample voltage and changes the development bias accordingly. (See page 2-30 for details.) The exposure lamp voltage is constant regardless of the image density of the original. (See page 2-18 for details.)

3.7 EXPOSURE LAMP VOLTAGE CONTROL

The main board controls the exposure lamp voltage through the ac drive board. The exposure lamp voltage is based on the base lamp voltage and various correction factors. The exposure lamp data setting determines the base lamp voltage. The following table gives the approximate lamp voltage for each data setting.

Exposure Lamp Data/Voltage Reference Table

Exposure Lamp Data	Exposure Lamp Voltage (Standard)		Exposure Lamp Data	Exposure Lamp Voltage (Standard)	
	115V machine	220/240V machine		115V machine	220/240V machine
100	57.1	105.9	126	71.9	133.4
101	57.6	106.9	127	72.5	134.5
102	58.2	108.0	128	73.0	135.5
103	58.8	109.1	129	73.6	136.6
104	59.3	110.1	130	74.2	137.6
105	59.9	111.2	131	74.7	138.7
106	60.5	112.2	132	75.3	139.8
107	61.1	113.3	133	75.9	140.8
108	61.6	114.4	134	76.5	141.9
109	62.2	115.4	135	77.0	142.9
110	62.8	116.5	136	77.6	144.0
111	63.3	117.5	137	78.2	145.1
112	63.9	118.6	138	78.7	146.1
113	64.5	119.6	139	79.3	147.2
114	65.0	120.7	140	79.9	148.2
115	65.6	121.8	141	80.5	149.3
116	66.2	122.8	142	81.0	150.4
117	66.8	123.9	143	81.6	151.4
118	67.3	124.9	144	82.2	152.5
119	67.9	126.0	145	82.7	153.5
120	68.5	127.1	146	83.3	154.6
121	69.0	128.1	147	83.9	155.6
122	69.6	129.2	148	84.4	156.7
123	70.2	130.2	149	85.0	157.8
124	70.8	131.3	150	85.6	158.8
125	71.3	132.4			

NOTE: Exposure lamp rating: 100V machine: 85V/300W
115V machine: 97V/300W
220/240V machine: 180V/330W

The exposure lamp voltage consists of the following 3 factors:

Exposure lamp voltage = Base lamp voltage factor
+
Reproduction ratio correction factor
+
Drum wear correction factor

3.7.1 Base Lamp Voltage Factor In Manual Image Density Control

Darker ⟷ Lighter

Manual ID Level	1	2	3	4	5	6	7
Exposure Lamp Data	Vo –4	Vo ±0	Vo ±0	Vo ±0	Vo +4	Vo +8	Vo +12

The above table shows changes in the exposure lamp data in manual image density mode.

SP mode #48 sets the exposure lamp data for level 4 (Vo) of manual image density mode. A value from 100 to 150 can be selected.

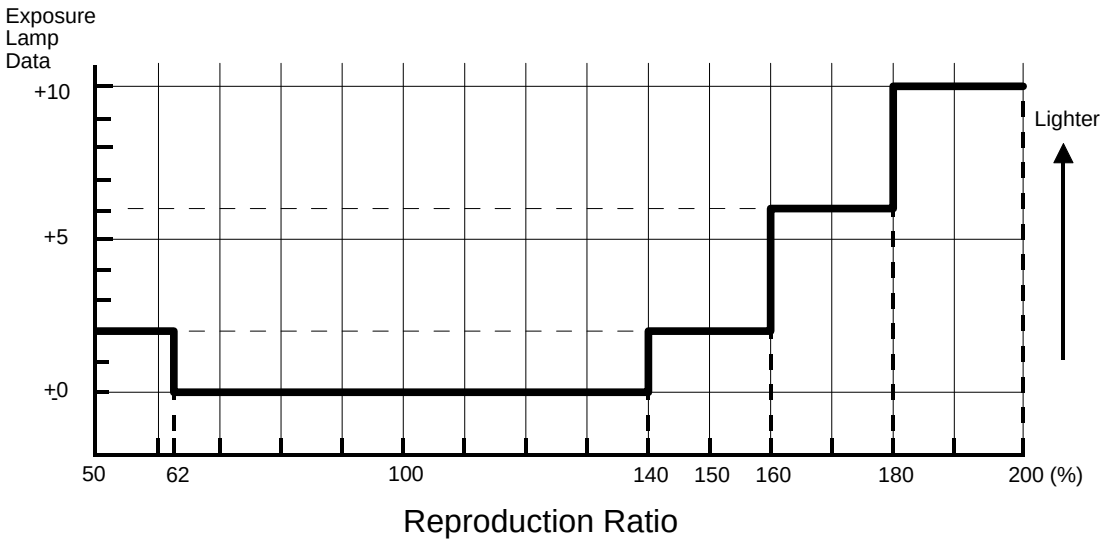
3.7.2 Base Lamp Voltage Factor In Auto Image Density Control

In auto ID mode, the CPU selects the level 4 (Vo) exposure lamp data regardless of the input from the auto image density sensor. When the auto image density level is set to lighter in SP mode #34, the exposure lamp data changes to that of manual ID level 5 as shown below. When the auto image density level is set to darker, the development bias shifts +40 volts. Only the development bias varies according to the input from the auto image density sensor. (See page 2-30).

Auto Image Density Level (SP mode #34)

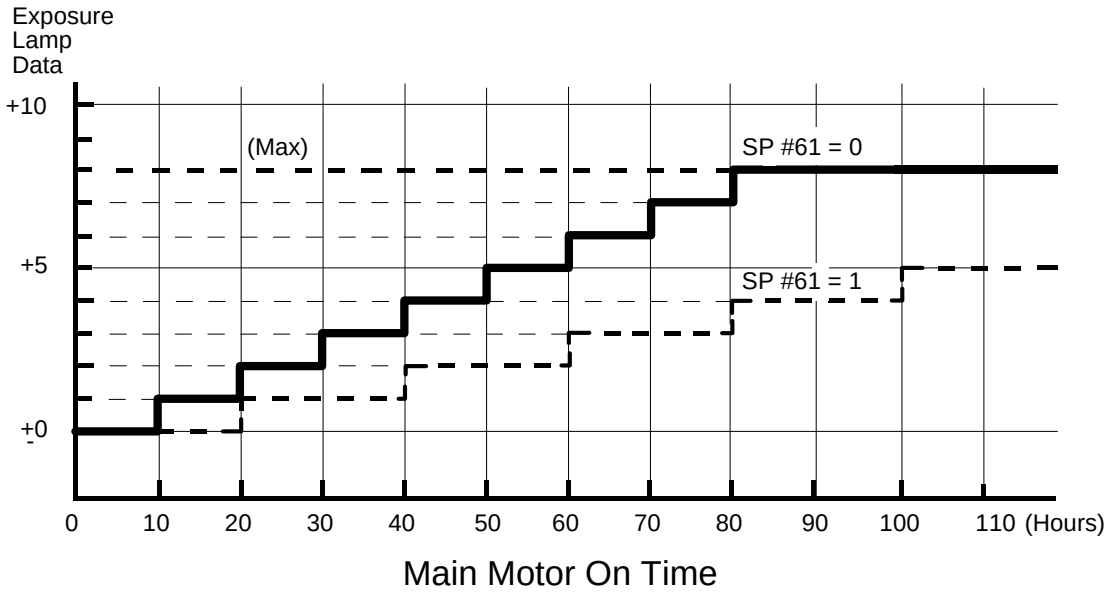
Auto Image Density Level	SP Data (SP mode #34)	Exposure Lamp Data	Development Bias Shift
Normal	0	Same as level 4 (Vo ±0)	±0 volts
Darker	1	Same as level 4 (Vo ±0)	+40 volts
Lighter	2	Same as level 5 (Vo +4)	±0 volts

3.7.3 Reproduction Ratio Correction Factor



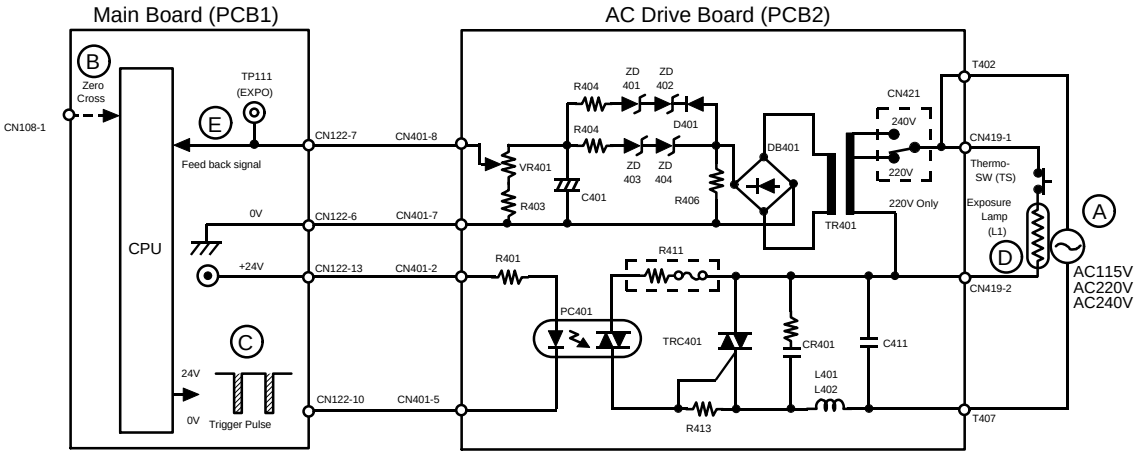
For the reduction and enlargement reproduction ratios the light path is longer than for the full size reproduction ratio. For this reason, the exposure lamp voltage is increased when reduction or enlargement is selected. The above chart shows the exposure lamp data at various reproduction ratios.

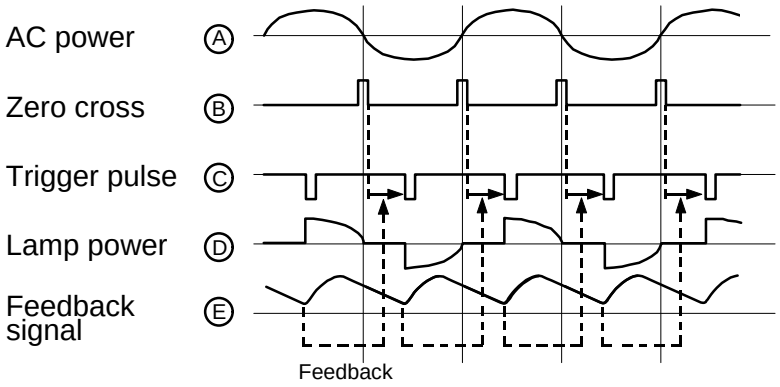
3.7.4 Drum Wear Correction Factor



To compensate for OPC drum wear caused by contact with the cleaning brush, the exposure lamp voltage is increased at set intervals of main motor ON time. When SP mode #61 is set to 0, exposure lamp data is increased 1 at 10-hour intervals. When SP mode #61 is set to 1, the data is increased 1 at 20-hour intervals. The total increase cannot exceed 8.

3.8 EXPOSURE LAMP CONTROL CIRCUIT





The main board sends lamp trigger pulses to the ac drive board from CN122-10. PC401 activates TRC401, which provides ac power to the exposure lamp, at the trailing edge of each trigger pulse.

The voltage applied to the exposure lamp is also provided to the feedback circuit. The feedback circuit steps down (TR401), rectifies (DB401), and smoothes (zener diodes and capacitors) the lamp voltage. The CPU monitors the lowest point of the smoothed wave (feedback signal), which is directly proportional to the actual lamp voltage.

The CPU changes the timing of the trigger pulses in response to the feedback voltage. If the lamp voltage is too low, the CPU sends the trigger pulses earlier so that more ac power is applied to the exposure lamp. This feedback control is performed instantly; so, the lamp voltage is always stable even under fluctuating ac power conditions.

The voltage applied to the exposure lamp can be changed with SP mode #48 (Light Intensity Adjustment). The ADS voltage adjustment (SP mode #56) must be done whenever the light intensity adjustment is done.

3.9 SERVICE CALL CONDITIONS

Service Code 11: Exposure Lamp Error

The feedback signal becomes higher than 4.2 volts (r.m.s.) for 1.0 second when the exposure lamp is on, or it becomes higher than 1.0 volt (r.m.s) for 1.0 second when the exposure lamp is off.

Service Code 12: Exposure Lamp Error

The feedback signal falls below 0.5 volt (r.m.s.) for 1.0 second when the exposure lamp is on, or the exposure lamp stays on for longer than 10 seconds.

Service Code 13: Zero Cross Signal Error

The CPU does not receive the zero cross signal within 0.56 second.

Service Code 21: Scanner Home Position Error

The scanner home position sensor remains off (LOW) 8 seconds after the main switch is turned on.

Service Code 22: Scanner Home Position Error

The scanner home position sensor is still on (HIGH) 1.0 second after the scanner starts.

Service Code 28: Lens Home Position Error

The lens home position sensor remains off (LOW) 3.5 seconds after the lens moves to the home position.

Service Code 29: Lens Home Position Error

The lens home position sensor is still on (HIGH) 3.5 seconds after the lens leaves the home position.

Service Code 2A: 4th/5th Mirror Home Position Error

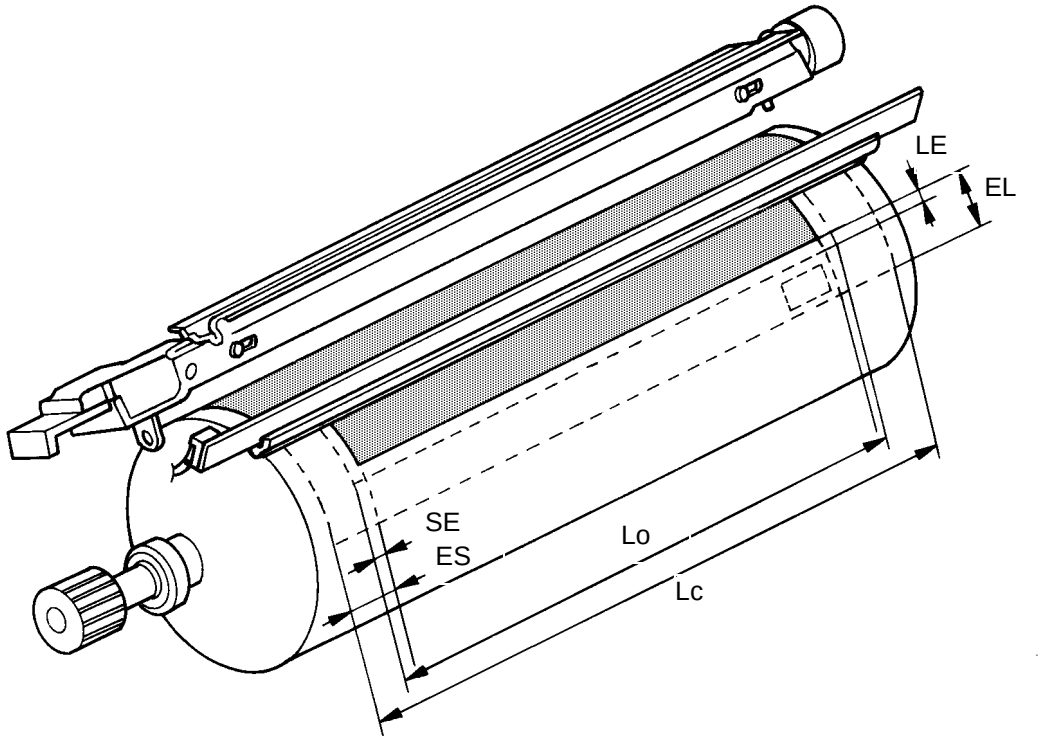
The 4th/5th mirror home position sensor is still on (HIGH) 2.5 seconds after the 4th/5th mirror assembly moves to the home position.

Service Code 2B: 4th/5th Mirror Home Position Error

The 4th/5th mirror home position sensor is still off (LOW) 2.5 seconds after the 4th/5th mirror assembly leaves the home position.

4. ERASE

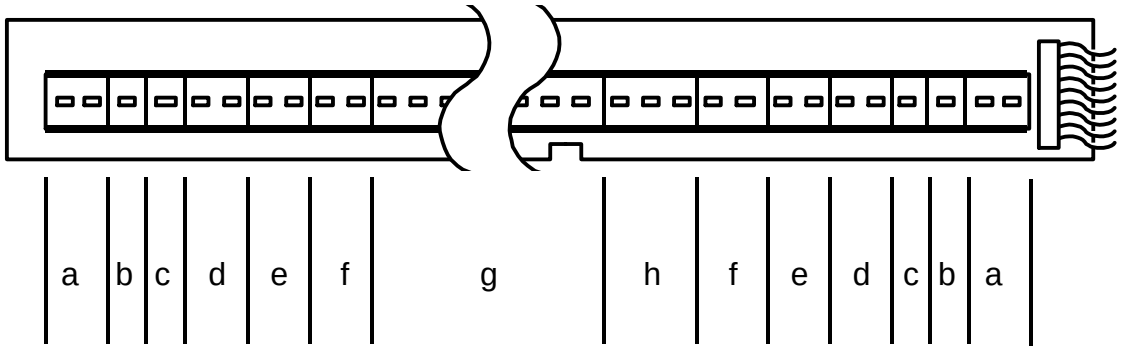
4.1 OVERVIEW



LE: Lead edge erase margin	2.5 ±1.5 mm
SE: Side erase margin	2.0 ±2.0 mm on each side; total of both sides 4 mm or less
LO: Original width	
LC: Charged width of drum	
EL: Lead edge erase	
ES: Side erase	

The erase lamp [A] consists of a line of LEDs extending across the full width of the drum [B].

The erase lamp has three functions: leading edge erase, side erase, and trail edge erase. Trail edge erase begins after the trailing edge of the copy paper; therefore, the trailing edge of the copy will not be erased.



4.1.1 Lead Edge Erase

The entire line of LEDs turns on when the main motor turns on. They stay on until the erase margin slightly overlaps the lead edge of the original image area on the drum (Lead Edge Erase Margin). This prevents the toner density sensor pattern from being developed every copy cycle and the shadow of the original edge from being developed on the paper. At this point, side erase starts. The width of the lead edge erase margin can be adjusted using SP mode #41.

During the image density detection cycle (once every ten copy cycles), a block of erase lamps (labeled "h" above) turns off long enough for the sensor pattern to be developed.

The entire line of LEDs turns on when the residual voltage on the OPC drum is being detected (Vr correction).

4.1.2 Side Erase

Based on the combination of copy paper size and the reproduction ratio data, the LEDs turn on in blocks (labeled "a" – "h" above). This reduces toner consumption and drum cleaning load.

The following table shows which erase lamp LEDs turn on.

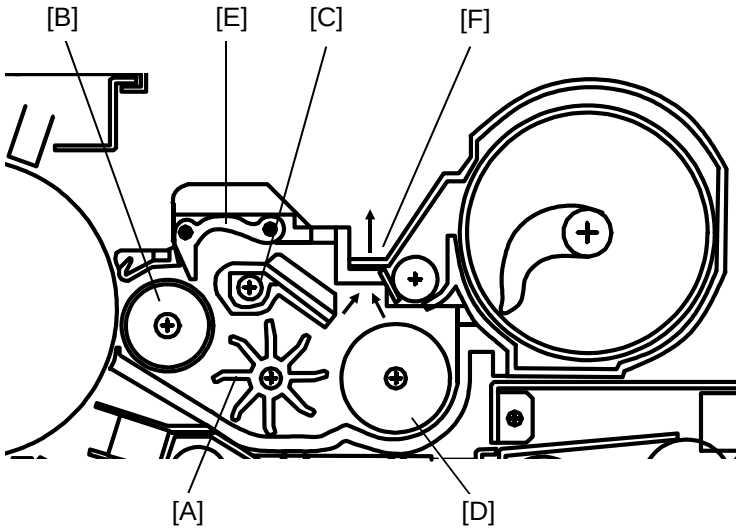
Blocks On	Paper Size	Reproduction Ratio (%)
None	A3, A4 sideways 11" x 17", 11" x 8 1/2	98 – 200
a		92 – 97
a – b	B4	86 – 91
a – c		80 – 91
a – d	8 1/2" x 11", 8 1/2" x 5 1/2" A4 lengthwise	71 – 79
a – e	B5 lengthwise	61 – 70
a – f	A5 lengthwise, 5 1/2" x 8 1/2"	50 – 60
a – f, g		For ID sensor pattern
All		For Vr correction

4.1.3 Trailing Edge Erase

The entire line of LEDs turns on again to erase the trailing edge after the latent image has passed. This prevents the trailing edge from appearing on the copy. The LEDs stay on to erase the leading edge of the latent image in the next copy cycle. After the final copy, the erase lamps turn off at the same time as the main motor.

5. DEVELOPMENT

5.1 OVERVIEW



When the main motor turns on, the paddle roller [A] development roller [B] the auger [C], and the agitator [D] start turning. The paddle roller picks up developer in its paddles and transports it to the development roller. Internal permanent magnets in the development roller attract the developer to the development roller sleeve.

The turning sleeve of the development roller then carries the developer past the doctor blade [E]. The doctor blade trims the developer to the desired thickness and creates backspill to the cross-mixing mechanism.

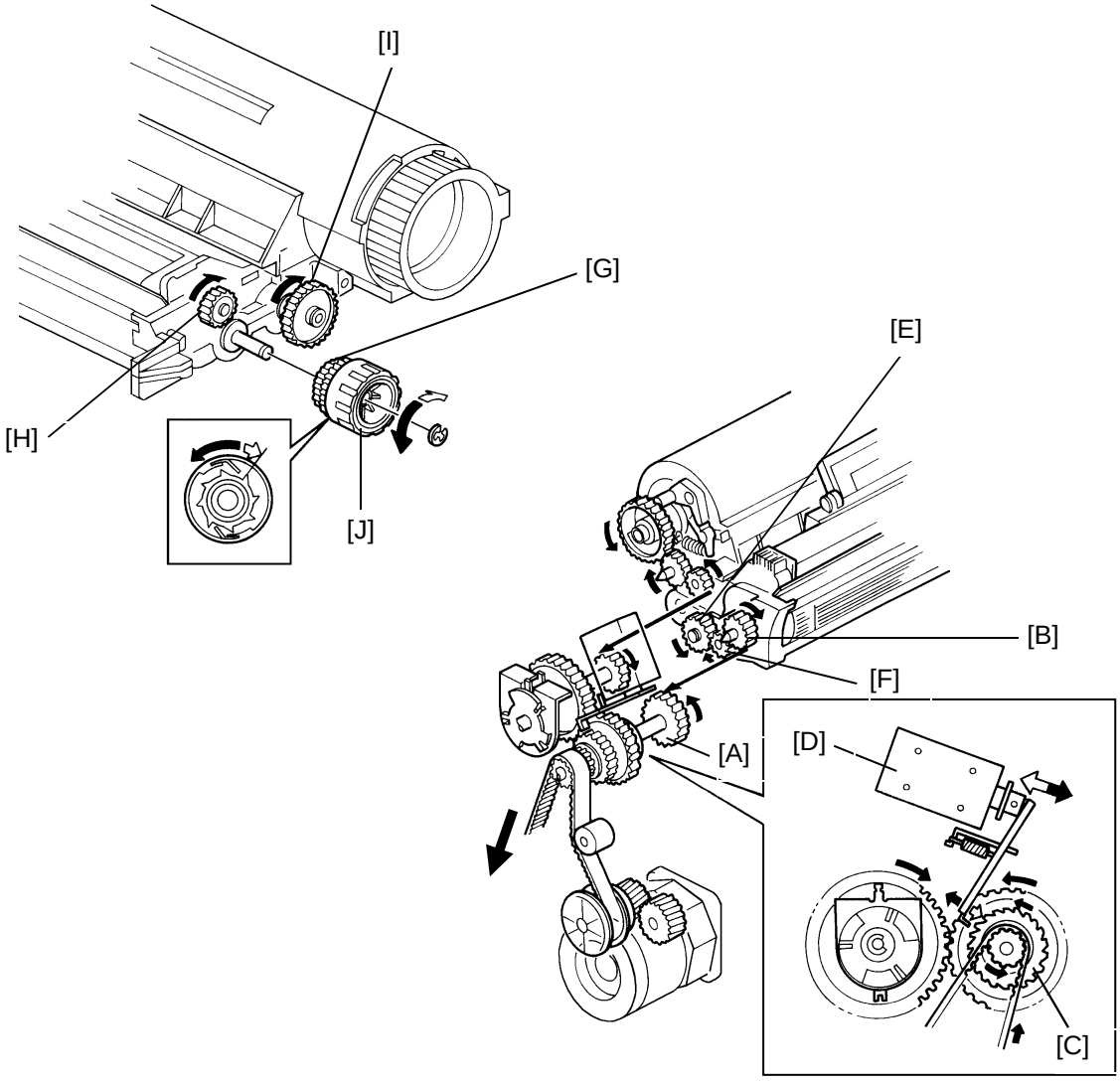
The development roller continues to turn, carrying the developer to the OPC drum. When the developer brush contacts the drum surface, the negatively charged areas of the drum surface attract and hold the positively charged toner. In this way, the latent image is developed.

The development roller is given a negative bias to prevent toner from being attracted to non-image areas on the drum that may have residual negative charge. The bias also controls image density.

After turning about 100 degrees more, the development roller releases the developer to the developer tank. The developer is agitated by the paddle roller, agitator [D], and the cross-mixing mechanism.

Rotation of the paddle roller and development roller tend to cause air pressure inside the unit to become higher than the air pressure around the development unit. A hole, fitted with a filter [F], has been added to the top of the unit to relieve air pressure and to minimize toner scattering.

5.2 DRIVE MECHANISM

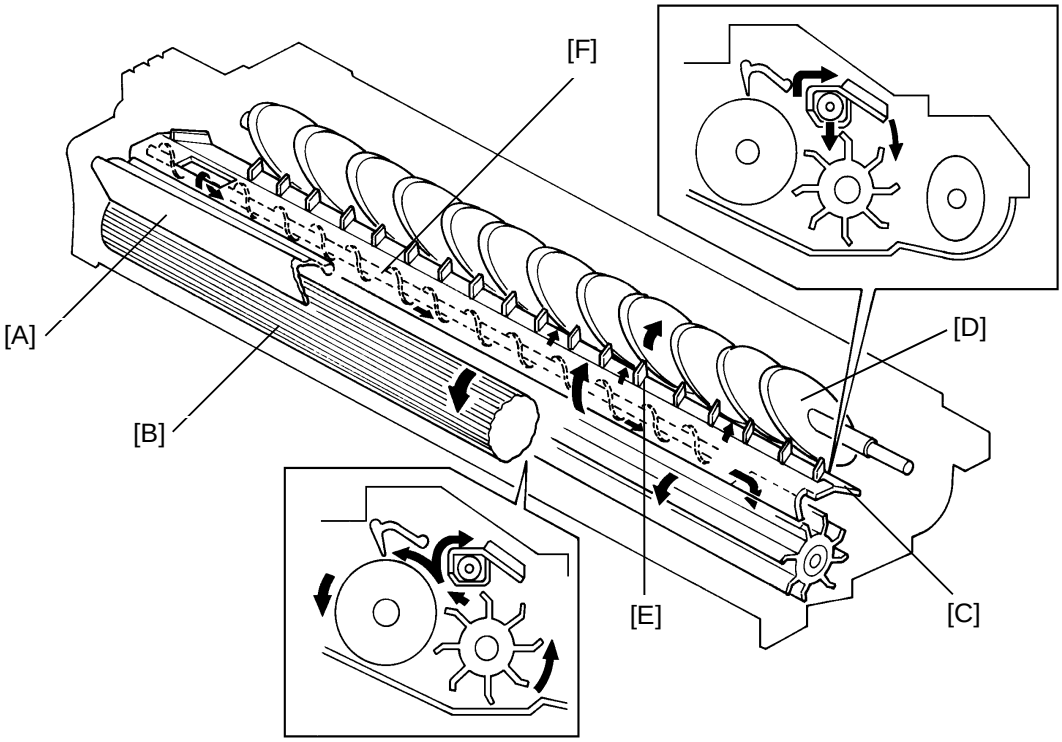


When the main motor turns, the rotation is transmitted from the development drive gear [A] to the development roller gear [B] through the development clutch [C]. (The rotation is transmitted to the development drive gear when the development solenoid [D] is de-energized.) Then, the rotation is transmitted from the development roller gear to the paddle roller gear [E] through the idle gear [F].

A gear [G] on the front end of the paddle roller shaft drives the auger gear [H] and the agitator gear [I]. The paddle roller shaft has a knob [J] on the front end so that it can be turned manually to exchange toner. The knob has a one-way clutch inside. The one-way clutch prevents the development roller from turning in the wrong direction.

The development clutch solenoid energizes each copy cycle after image development is completed. This stops the rollers, reducing developer fatigue.

5.3 CROSS-MIXING



This copier uses a standard cross-mixing mechanism to keep the toner and developer evenly mixed. It also helps agitate the developer to prevent developer clumps from forming and helps create the triboelectric charge.

The developer on the turning development roller is split into two parts by the doctor blade [A]. The part that stays on the development roller [B] forms the magnetic brush and develops the latent image on the drum. The part that is trimmed off by the doctor blade goes to the backspill plate [C].

As the developer slides down the backspill plate to the agitator [D], the mixing vanes [E] move it slightly toward the rear of the unit. Part of the developer falls into the auger inlet and is transported to the front of the unit by the auger [F].

The agitator moves the developer slightly to the front as it turns, so the developer stays level in the development unit.

5.4 DEVELOPMENT BIAS FOR IMAGE DENSITY CONTROL

Image density is controlled by changing two items: (1) the strength of the bias voltage applied to the development roller sleeve, and (2) the strength of the voltage applied to the exposure lamp.

Applying a bias voltage to the development sleeve reduces the potential between the development roller and the drum, thereby reducing the amount of toner transferred. As the bias voltage becomes greater, the copy image becomes lighter. Similarly, increasing the voltage to the exposure lamp causes an increase in light intensity which also results in lighter copies.

The method of control is different depending on whether the image density is manually selected or the automatic ID mode is used.

The development bias applied to the development roller sleeve has the following three factors:

Development bias voltage = Base bias voltage factor
(Manual or automatic image density control)
+
Base bias voltage adjustment factor
+
Vr correction factor

The base bias voltage for non-image areas is –200 volts (Fixed).

5.4.1 Base Bias Voltage Factor In Manual Image Density Control

Darker ← → Lighter

Manual ID Level	1	2	3	4	5	6	7
Base Bias Voltage	–120	–120	–160	–200	–200	–240	–280
Exposure Lamp Data	Vo –4	Vo	Vo	Vo	Vo +4	Vo+8	Vo+12

In manual ID control mode, the base bias voltage depends on the manually selected ID level. The voltage applied at each ID level is shown in the above table. The base exposure lamp voltage also varies depending on the manual ID level as shown in the table. (See page 2-18 for more information.)

5.4.2 Base Bias Voltage Factor In Automatic Image Density Control

In automatic image density control mode, the base exposure lamp voltage is fixed to Vo. (See page 2-18 for more information.) Image density is controlled by changing only the base bias voltage.

The base bias voltage depends on the background image density of the original, which is measured using the original ID sensor. (See page 2-18 for more information.)

The CPU checks the voltage output from the automatic ID circuit. This circuit has a peak hold function. The peak hold voltage corresponds to the maximum reflectivity of the original. The CPU then determines the proper base bias level with reference to the peak hold voltage.

The following table gives the base bias voltages at each ADS output level.

When the automatic density level is set to darker by SP mode #34, the base bias voltage shifts +40 volts as shown in the following table.

K	Base Bias Voltage	
	Normal or Lighter (SP mode #34 = 0 or 2)	Darker (SP mode #34 = 1)
$K \geq TH1$	–200 volts	–160 volts
$TH1 > K \geq TH2$	–260 volts	–220 volts
$TH2 > K \geq TH3$	–320 volts	–280 volts
$TH3 > K$	–380 volts	–340 volts

$$K = \frac{\text{ADS Output Voltage (Peak Hold Voltage)}}{\text{ADS Adjusted Voltage (SP \#56)}}$$

TH1 to 3: Threshold level (See the following table.)

To maintain the correct image density, the lamp data is incremented when the reproduction ratio is changed and/or drum wear correction is done. This increment in the lamp data increases the intensity of light reflected from the original. Therefore, the ADS output voltage also changes.
In order to maintain a constant voltage for the same original when the lamp data is incremented, the threshold levels are shifted with each increment in the lamp data as shown in the following table.

Increase of lamp data	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9
TH1	0.70	0.75	0.80	0.85	0.89	0.94	0.98	1.03	1.08	1.12
TH2	0.66	0.70	0.74	0.78	0.83	0.87	0.91	0.96	1.00	1.04
TH3	0.29	0.31	0.33	0.35	0.37	0.39	0.41	0.43	0.45	0.48

5.4.3 Base Bias Voltage Adjustment Factor

Base Bias Adjustment
(Black toner: SP mode #37, Color Toner: SP mode #79)

Image Density	SP Data (SP mode #37 or #79)	Change of Base Bias Voltage
Normal	0	±0 volts
Darkest	1	+40 volts
Darker	2	+20 volts
Lighter	3	–20 volts
Lightest	4	–40 volts

The base bias voltage can be changed in SP mode #37 for black toner or #79 for color toner to adjust the image density level. The above table gives the base bias voltage for each SP mode setting. This adjustment should be done only when the exposure lamp voltage adjustment (SP mode #48) fails to achieve the desired image density.

5.4.4 Vr Correction Factor

As the OPC drum is used, drum residual voltage (Vr) gradually increases. Vr correction compensates for residual voltage on the drum. Vr correction is done every 1,000 copies based on the data of the drum counter (SP mode #69) and the Vr correction ratio (L) (SP mode #67). The following chart shows how the bias voltage changes depending on the Vr correction ratio (L).

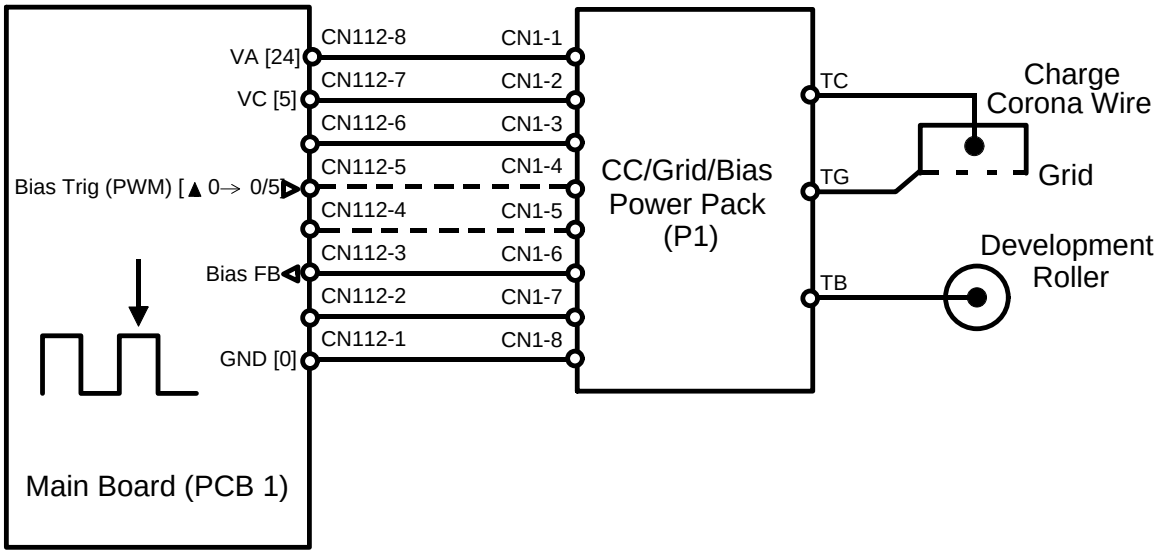
Vr Correction Factor

L	Change of Bias Voltage
100 to 89 (%)	±0 (volts)
88 to 76 (%)	–40 (volts)
75 to 62 (%)	–80 (volts)
61 to 45 (%)	–120 (volts)
44 to 0 (%)	–160 (volts)

NOTE: L = Vrp/Vsg x100 (Vr Correction Ratio)
Vrp: ID sensor output for Vr correction pattern
Vsg: ID sensor output for bare drum

When the Vr correction is made every 1,000 copies, all blocks of erase lamps turn on and the development bias becomes 0 volts to develop the Vr correction pattern.

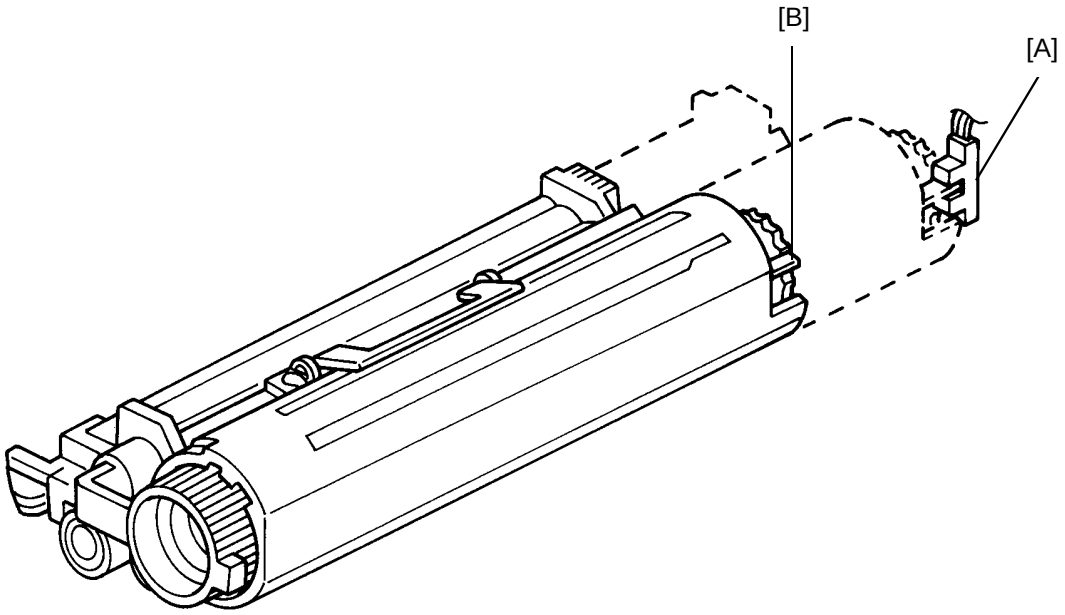
5.5 DEVELOPMENT BIAS CIRCUIT



The main board supplies +24 volts to the CC/Grid/Bias power pack at CN1-1 as the power supply source. When the Start key is pressed, the CPU starts sending the bias trigger pulse to CN1-4. This energizes the development bias circuit within the CC/Grid/Bias power pack, which applies a high negative voltage to the development roller. The development bias is applied whenever the drum is rotating except when the Vr pattern is developed.

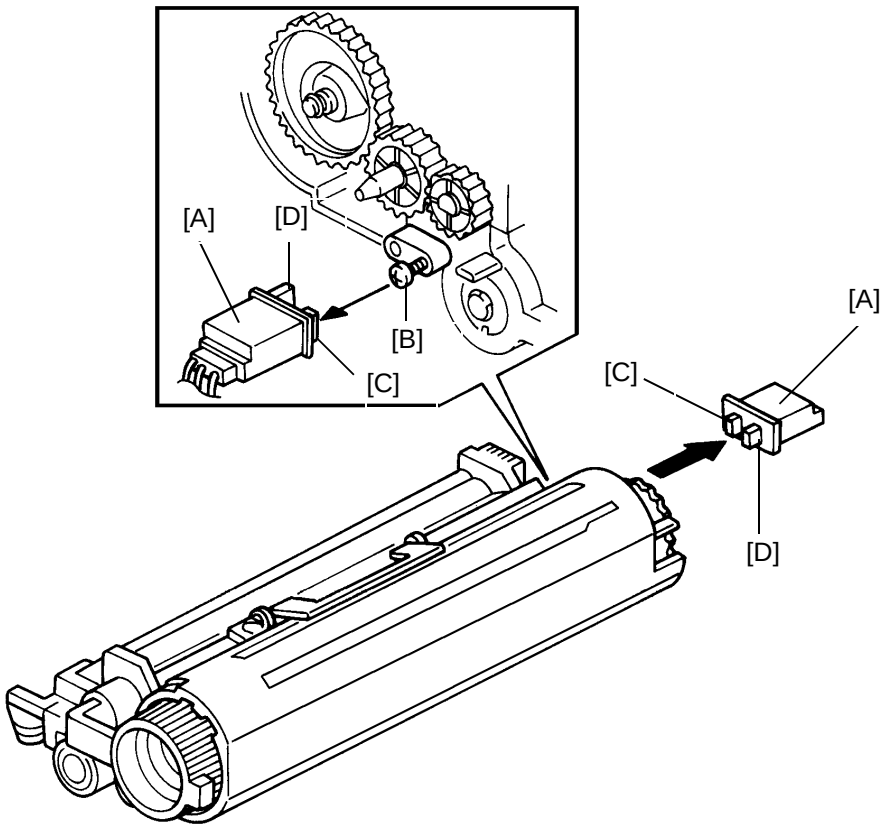
The bias trigger pulse applied to CN1-4 is a pulse width modulated signal (PWM signal). This signal is also used to change the voltage level of the development roller. As the width of the trigger pulses increase, the voltage of the development roller also increases. The CPU monitors the development bias voltage at CN1-6 and controls the width of the bias trigger pulses based on this feedback.

5.6 DEVELOPMENT UNIT SET SENSOR



When the development unit is removed from the copier, the development unit set sensor (S12) [A] sends a LOW signal to the main board and "U3" lights in the operation panel. When the development unit is properly set in the copier, the sensor is actuated by a projection [B] on the rear of the toner supply unit and "U3" turns off.

5.7 COLOR DEVELOPMENT UNIT DETECTION



Color Development Unit Detection Table

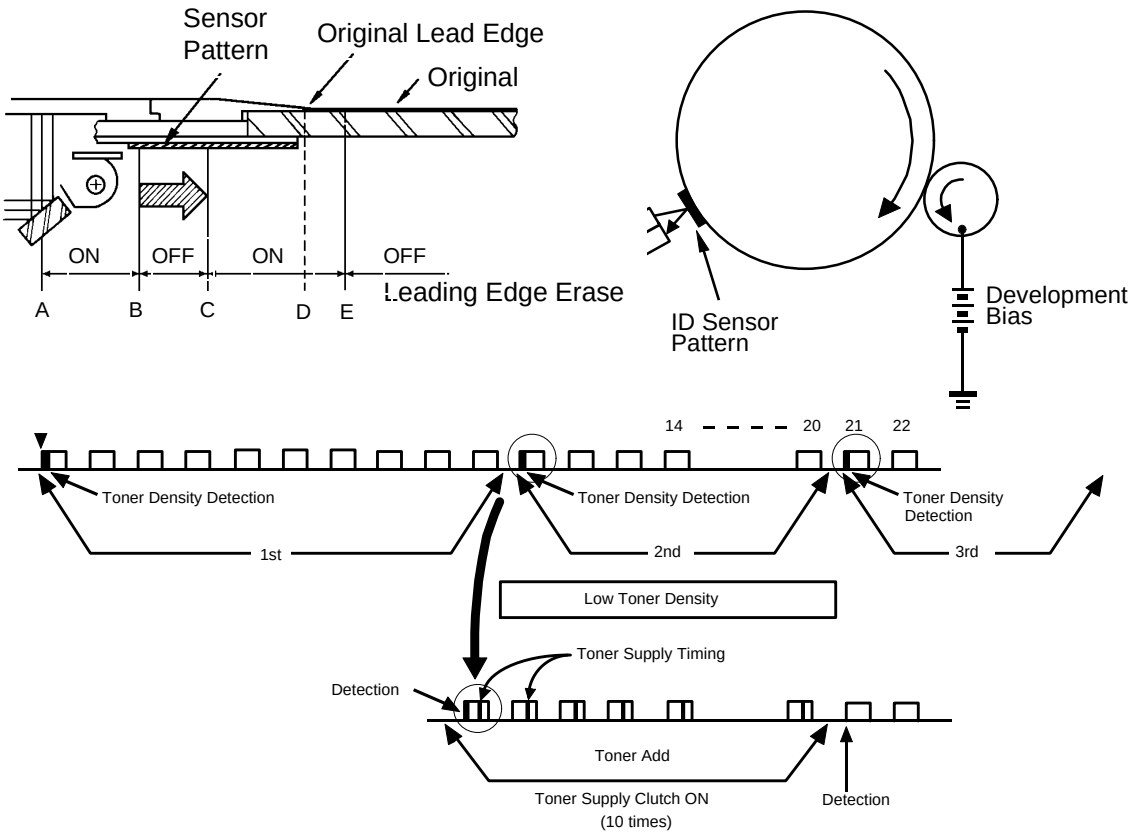
SW 8-1	SW 8-2	Color
OFF	OFF	Black
ON	OFF	Red
OFF	ON	Green
ON	ON	Blue

ON: LOW
OFF: PULSE

When a color development unit is installed in the copier, the color switch [A] is activated by screw [B] at the rear side of the development unit. The color switch has two microswitches (SW8-1 [C] and 8-2 [D]) inside. The CPU receives a LOW signal from the microswitch activated by the screw and determines which color unit has been installed.

6. TONER DENSITY DETECTION AND TONER SUPPLY

6.1 DETECT SUPPLY MODE



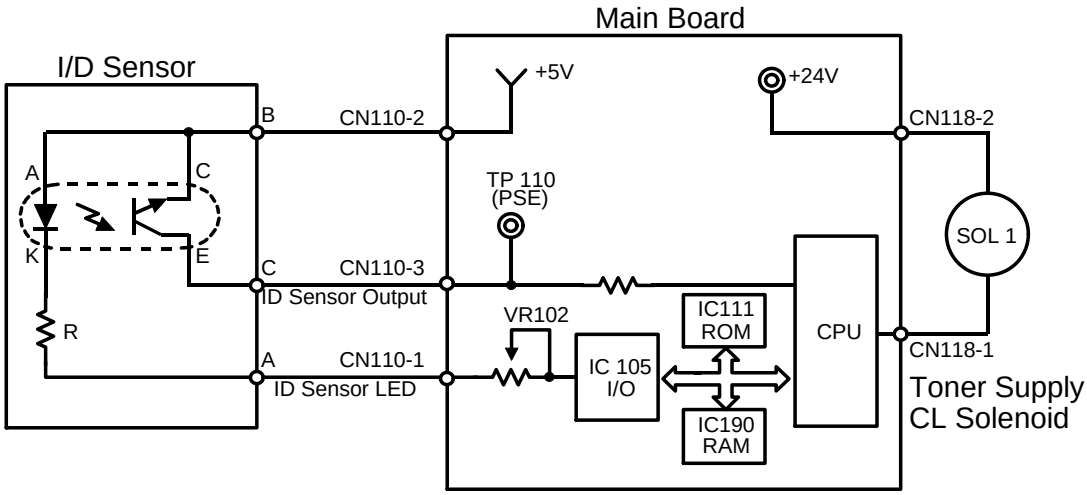
The CPU checks toner density by directly sensing the image density every 10 copy cycles (every 5 copies for the color development unit). If the RAM is cleared (SP mode #99), or a new RAM is installed, the CPU checks the image density at the beginning of the first copy cycle.

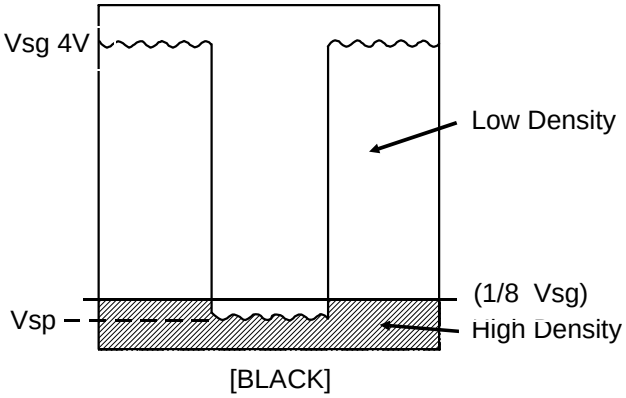
During the check cycles, the sensor pattern is exposed prior to exposure of the original. After the sensor pattern is developed, its reflectivity is checked by the image density sensor (a photosensor). The CPU notes the reflectivity. If the reflected light is too strong, indicating a too low toner density condition, toner is added to the development unit.

The toner is not added all at once. The CPU energizes the toner supply clutch solenoid for the proper amount of time to add a selected amount of toner over the next 10 cycles.

When a color development unit is used, the CPU automatically selects fixed toner supply mode.

6.2 ID SENSOR FUNCTION IN DETECT SUPPLY MODE





The image density sensor checks the density of the sensor pattern image once every 10 copy cycles. The CPU receives two voltage values directly from the sensor: the value for the bare drum (Vsg) and the value for the sensor pattern (Vsp). These two values are then compared to determine whether more toner should be added.

1. Vsp ≤1/8 Vsg .....No toner is added. (High density)
2. Vsp >1/8 Vsg .....Toner is added.(Low density)

When the image density is too low, the CPU activates the toner supply clutch solenoid to add toner over the next 10 copy cycles. The amount of toner added depends on the value of Vsp, the selected toner supply ratio (SP mode #31) and the paper size in use. (See page 2-42 for more information.)

When the data of SP mode #35 is set to "1" (factory setting = "0"), the CPU changes the interval of the ID check from every 10 copies to every 5 copies for the black development unit.

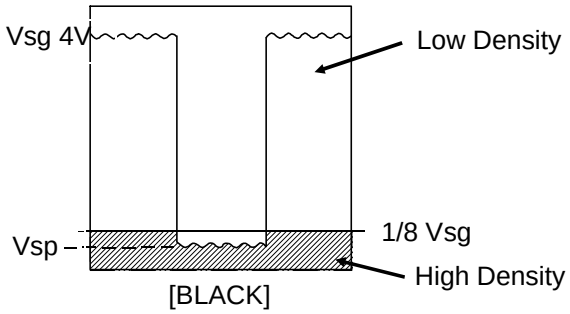
6.3 FIXED SUPPLY MODE

When the data of SP mode #30 is "1" (factory setting = "0") or a color development unit is installed, the fixed supply mode is selected. In this case, a fixed amount of toner is added every copy cycle depending on the selected toner supply ratio (SP mode #32 (black toner), SP mode #70 (color toner), the paper size in use, and the supply mode data. (See page 2-44 for more information.)

6.4 ID SENSOR FUNCTION IN FIXED SUPPLY MODE

6.4.1 Black Development Unit

In fixed supply mode, toner is supplied every copy cycle according to the fixed toner supply ratio data (SP mode), the paper size data and the color data. However, the toner supply clutch solenoid is de-energized to prevent over-toning when Vsp is lower than 1/8 Vsg.

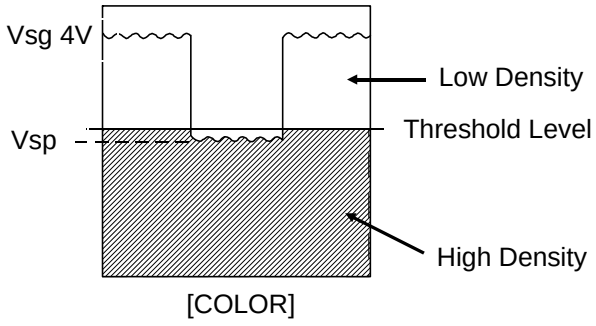


6.4.2 Color Development Unit

When a color development unit is installed, the CPU automatically selects the fixed toner supply mode. The amount of toner supplied depends on the fixed toner supply ratio (SP mode #70), the paper size data and the kind of color data.

The CPU calculates the threshold level for toner supply when the color developer initial setting (SP mode #10) procedure is completed. This level is determined by calculating the average of Vsp/Vsg x 100 (%).

Since the fixed supply mode is selected when in color toner mode, it is necessary to inhibit toner supply if the toner density becomes high to prevent over-toning. The CPU checks Vsp once every 5 copy cycles. If Vsp becomes lower than the threshold level, the CPU stops supplying toner. Toner supply resumes when Vsp rises above the threshold level again.



The threshold level (a percentage) for each color can be monitored in SP mode #80 (Red), #81 (Green) and #82 (Blue).

6.5 ABNORMAL CONDITION IN TONER DENSITY DETECTION

If the Vsg goes below 2.5 volts (Vsg abnormal) or Vsp goes above 2.5 volts (Vsp abnormal) 5 times in a row, the CPU determines that toner density detection is abnormal. The CPU changes from the detect supply mode to the fixed supply mode. At the same time either the Auto ID indicator or the selected manual ID level starts blinking, and the machine can be operated.

Abnormal Condition In Toner Density Detection

SP mode #55 Display		Conditions
Vsp	Vsg	
varies	0.00	Vsg ≤ 2.5 (Vsg Abnormal)
varies	5.00	Vsp ≥ 2.5 (Vsp Abnormal)

6.6 DEVELOPMENT BIAS FOR ID SENSOR

The development bias for the ID sensor consists of the following 2 factors:

Development bias voltage = Toner density adjustment factor
+
Vd correction factor

The development voltage for the Vr correction is 0 volts.

6.6.1 Toner Density Adjustment Factor

Toner Density Adjustment
(Black Toner: SP Mode #33, Color Toner: SP Mode #75)

Toner Density	SP Data (SP mode #33 or #75)	Development Bias Voltage			
		Black Toner	Red Toner	Blue Toner	Green Toner
Normal	0	–260 volts	–240 volts	–300 volts	–320 volts
Low	1	–220 volts	–200 volts	–260 volts	–280 volts
High	2	–280 volts	–260 volts	–320 volts	–340 volts
Higher	3	–300 volts	–280 volts	–340 volts	–360 volts
Developer Initial Setting		–340 volts	–280 volts	–240 volts	–240 volts

The development bias can be adjusted by SP mode #33 for black toner or #75 for color toner to adjust the toner density level. The above chart shows the development bias voltage corresponding to setting of SP #33 or #75. This adjustment should be used only when the exposure lamp voltage adjustment (SP mode #48) can not achieve the desired image density.

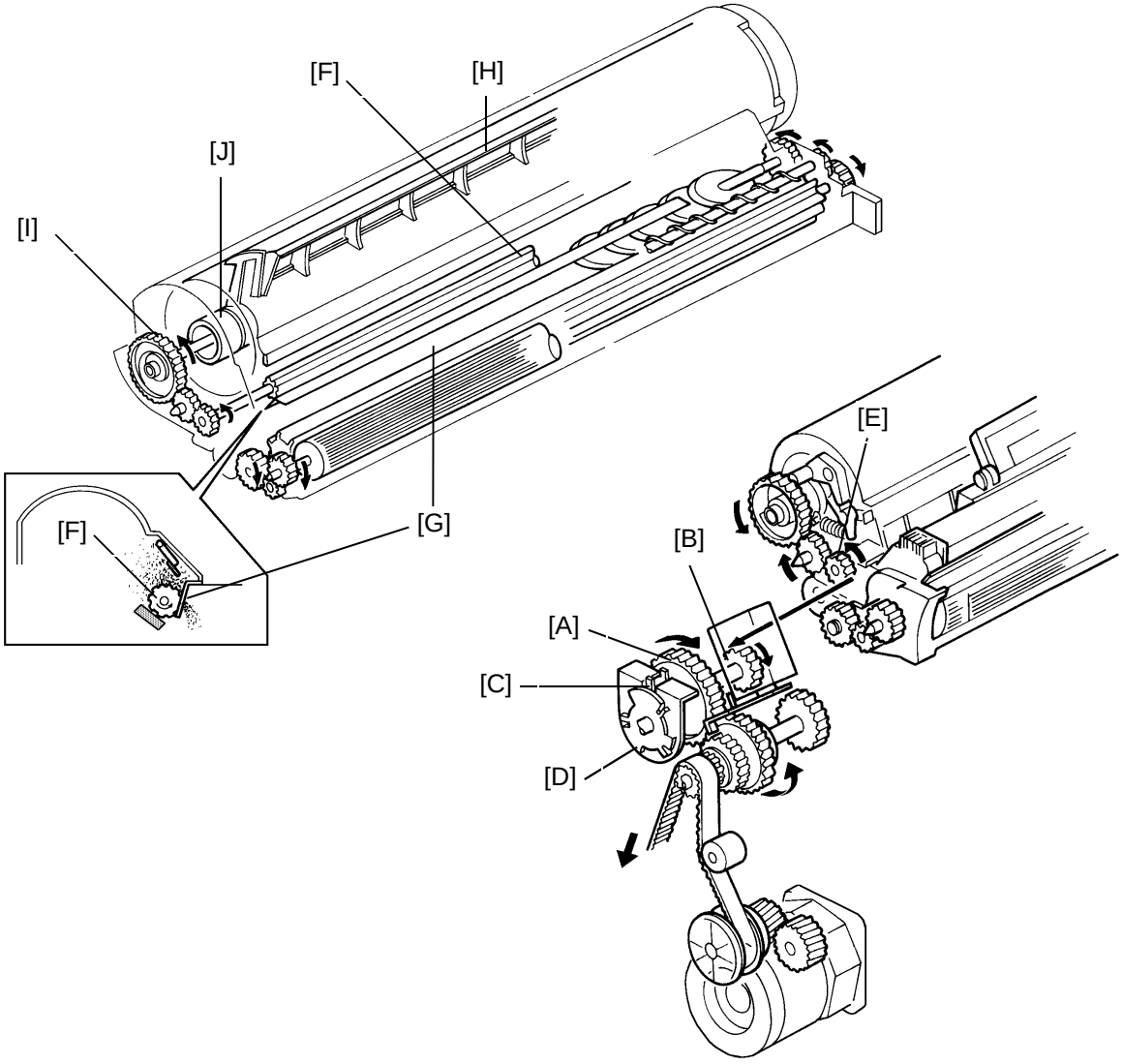
6.6.2 Vd Correction Factor (Only For Black Toner)

After developer is replaced, the triboelectric charge sometimes changes as the new developer mixture is not stabilized in during the first 500 copies. The development bias for the ID sensor is adjusted automatically to compensate for these changes.

The CPU calculates the threshold level for the Vd correction when the black developer initial setting procedure (SP mode #65) is completed. This threshold level is the average of Vsp/Vsg x 100 (%). The result of the calculation can be monitored by SP mode #64. The CPU has a software counter to count number of copies made with the developer. The counter resets to "0" when SP mode #65 is performed. The Vd correction is made based on the data of the counter and of SP mode #64. The following table gives the threshold levels for each data value of SP#64.

SP Data (SP mode #64)	Vsp/Vsg x100 (%)	Change of Development Bias Voltage	
		0 to 499 copies	More than 500 copies
0	12 to 15	±0 volts	±0 volts
1	0 to 7	–40 volts	±0 volts
2	8 to 11	–20 volts	±0 volts
3	16 to 21	±0 volts	+20 volts
4	More than 22	±0 volts	+40 volts

6.7 TONER SUPPLY AND AGITATOR DRIVE MECHANISM



The toner supply clutch gear [A] turns when the main motor is on. The transmission of this rotation to the toner supply drive gear [B] is controlled by the toner supply clutch [C].

When the toner supply clutch solenoid [D] energizes, the toner supply clutch engages and starts turning the toner supply drive gear. The toner supply drive gear turns the toner supply roller gear [E]. Toner catches in the grooves on the toner supply roller [F]. Then, as the grooves turn past the pin hole plate [G], the toner drops into the development unit through the pin holes.

The toner agitator [H] mechanism, which is contained in the toner cartridge, prevents toner from blocking. The toner agitator gear [I] turns whenever the toner supply clutch solenoid is engaged. Rotation passes through the toner cartridge casing to the agitator junction [J].

6.8 TONER SUPPLY AMOUNT

This copier has two different ways of controlling the amount of toner supplied. Normally, the detect supply mode controls toner supply for the black development unit; however, a fixed supply mode also can be selected by SP mode #30. When the color development unit is installed, the fixed supply mode controls toner supply regardless of the setting of SP mode #30.

6.8.1 Detect Supply Mode (SP mode #30 = 0)

The amount of toner supplied depends on the ID sensor data, the detect toner supply ratio data, and the paper size. The toner supply clutch solenoid on time in each copy cycle is calculated as follows:

Toner Supply Clutch Solenoid ON Time = I x T x P (pulses)

Where : I = ID Sensor Data
T = Detect Toner Supply Ratio Data
P = Paper Size Data

For example: Vsp = 0.65 volts, which means the toner supply level is "2" and the ID sensor = 29.

The data of SP mode #31 is set to "0".
The toner supply ratio is 15 % and the toner supply data = 2.

Paper size is A4 or LT.
The paper size data = 1.

Toner Supply Clutch ON Time = I x T x P
= 29 x 2 x 1
= 58 (pulses)
= 232 (m sec.) (1 pulse = 4.0 m sec.)

ID Sensor Data

Vsp/Vsg x100 (Vsp, if Vsg = 4.0 volts)	Toner Supply Level (Toner Supply Ratio, if SP #31 = 0)	ID Sensor Data
0 to 12.5 % (0 to 0.5 volts)	No toner supply (0 %)	0
12.5 to 15.0 % (0.5 to 0.6 volts)	1 (3.75 %)	15
15.0 to 17.5 % (0.6 to 0.7 volts)	2 (7.5 %)	29
17.5 to 25.0 % (0.7 to 1.0 volts)	3 (15 %)	59
25.0 to 62.5 % (1.0 to 2.5 volts) (See note below.)	4 (30 %)	118
62.5 to more than 100 % (2.5 to 5.0 volts)	Fixed supply mode	N/A

NOTE: If this condition is detected two times consecutively, the toner supply ratio rises to 60% (ID Sensor Data = 236), which is double that at toner supply level 4.

Detect Toner Supply Ratio Data (SP mode #31)

SP Data (SP mode #31)	Toner Supply Ratio	Toner Supply Ratio Data
0	15 %	2
1	7 %	1
2	30 %	4
3	60 %	8

Paper Size Data

Paper Size	Paper Size Data
Paper Size ≤ A4 or LT	1
Paper Size > A4 or LT	2

6.8.2 Fixed Supply Mode (SP mode #30 = 1)

The amount of toner supplied depends on the fixed toner supply ratio data, the paper size data and the color data. The toner supply clutch solenoid on time in each copy cycle is calculated as follows:

Toner Supply Clutch Solenoid ON Time = T x P x 2 x C (pulses)

Where: T = Fixed Toner Supply Ratio Data
P = Paper Size Data
C = Color Data

For example: The data of SP mode #32 is set to "0".
The toner supply ratio is 7.0% and the toner supply data = 2.

Paper size is A4. The paper size data = 29.
Black toner is used. The color data = 1.

Toner Supply Clutch ON Time = T x P x 2 x C
= 2 x 29 x 2 x 1
=116 (pulses)
= 464 (m sec.) (1 pulse = 4.0 m sec.)

Fixed Toner Supply Ratio Data (Black Toner: SP mode #32)

SP Data (SP mode #32)	Toner Supply Ratio	Toner Supply Ratio Data
0	7.0 %	2
1	3.5 %	1
2	10.5 %	3
3	14.0 %	4

Fixed Toner Supply Ratio Data (Color Toner : SP mode #70)

SP Data (SP mode #70)	Toner Supply Ratio	Toner Supply Ratio Data
0	14.0 %	2
1	7 .0%	1
2	21.0 %	3
3	28.0 %	4

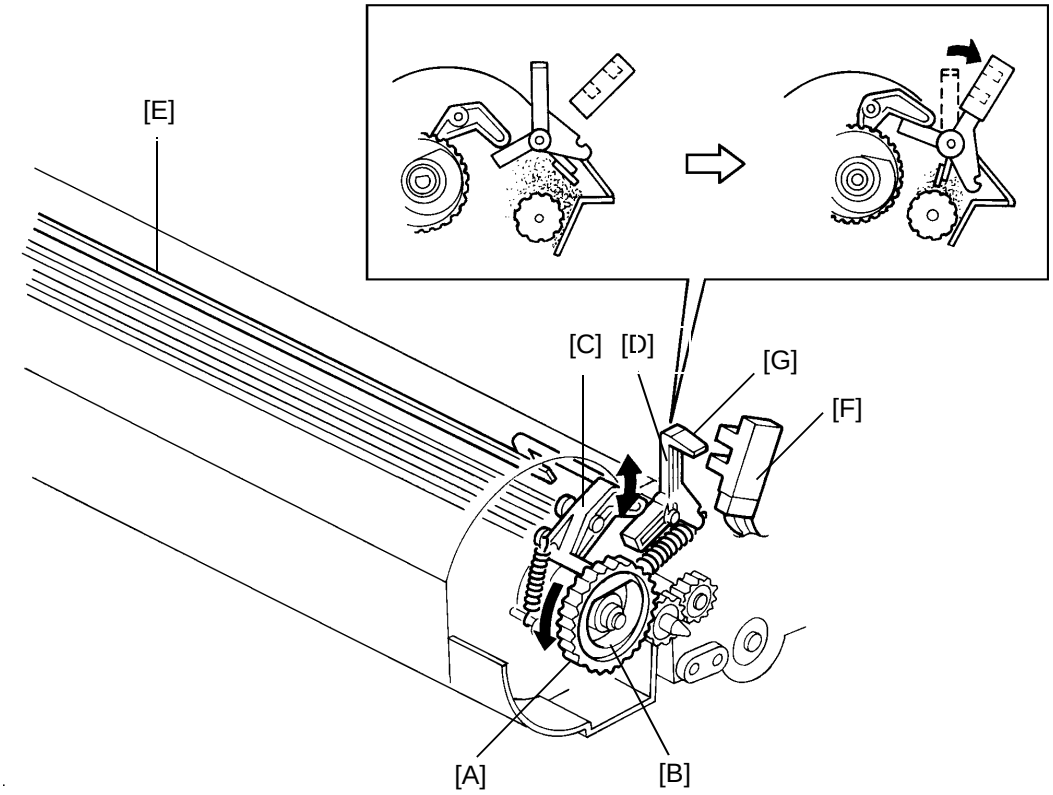
Paper Size Data

Paper Size	Paper Size Data
A3	58
B4	43
A4	29
B5	23
A5	15
B6	11
11" X 17"	55
8 1/2" X 14"	37
8 1/2" X 11"	27
5 1/2" X 8 1/2"	14
Universal (*)	29
Paper size not detected	0

Color Data

Color	Color Data
Black	1
Red	2
Blue or Green	1.2

6.9 TONER END DETECTION



The toner agitator gear [A] has a cam [B] (the toner end cam) on its inner surface, and it rotates only when toner is supplied. The cam follower on the end of the toner end lever [C] rides on the surface of the toner end cam (spring pressure). The opposite end of the toner end lever alternately presses and releases the toner end arm [D] as the cam turns. The toner end plate [E], which is in the toner hopper, is mounted on the same shaft as the toner end arm.

When there is sufficient toner in the hopper, the toner end plate is prevented from moving by the toner. Therefore, even when the toner end lever drops to the lowest position on the cam (releasing the toner end arm), the toner end arm does not move and the toner end sensor [F] is not activated.

When there is insufficient toner in the hopper, the toner end plate can move. When the toner end lever releases the toner end arm, the toner end plate lowers and the actuator [G] on the toner end arm moves into the toner end sensor. The CPU receives a single pulse from the toner end sensor.

If this condition is detected by the CPU two times consecutively, the Add Toner indicator starts blinking.

After the indicator starts blinking, 50 copies can be made. If a new toner cartridge is not added within that 50 copy interval, the Add Toner indicator stops blinking (stays on) and copying is inhibited. If the main switch is turned off and on after this, only 1 copy can be made each time.

The toner end condition is normally detected by the mechanism described here. However, it can also be detected using the ID sensor. The Add Toner indicator will start blinking in the following cases:

Black Development Unit: If Vsp exceeds 1/4 Vsg 10 times in a row.

Color Development Unit: If Vsp/Vsg exceeds 1.1 x threshold level 10 times in a row. The threshold level is the average of Vsp x Vsg, which is calculated and stored in RAM when the color developer initial setting (SP mode #10) procedure is completed.

When Vsp exceeds 1/4 Vsg in the black development unit, the CPU checks toner density every 5 copy cycles instead of every 10 copy cycles.

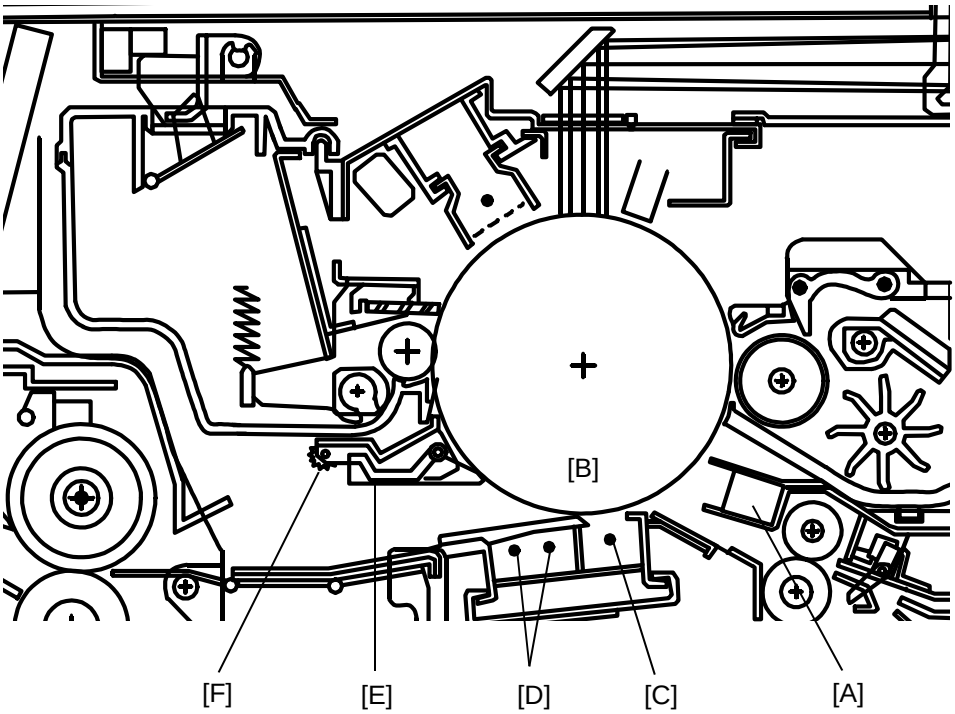
When the toner cartridge is replaced and the front cover is closed, the CPU turns on the main motor, the development clutch solenoid, and the toner supply clutch solenoid for approximately 3 seconds to supply toner to the empty toner supply unit from the toner cartridge. A toner end check is also done during this 3 second period. The CPU performs this operation a maximum of 3 times (9 seconds) to clear the toner end condition.

6.10 TONER SUPPLY UNIT INITIAL SETTING (SP mode #63)

When a brand-new machine is installed or the toner supply unit is replaced with a new one, the toner supply unit initial setting (SP mode #63) must be performed to prevent the CPU from falsely detecting toner end.

When SP mode #63 is performed, the CPU turns on the main motor, the development clutch solenoid, and the toner supply clutch solenoid for approximately 3 seconds to supply toner to the empty toner supply unit from the toner cartridge. A toner end check is also done during this 3 second period. The CPU performs this operation a maximum of 3 times (9 seconds) to clear the toner end condition.

7. IMAGE TRANSFER AND PAPER SEPARATION



7.1 PRE-TRANSFER LAMP (PTL)

After the latent image is developed but before the image is transferred to the copy paper, the drum surface is illuminated by the pre-transfer lamp [A]. This illumination reduces the negative potential on the drum surface [B]. This prevents the toner particles from being re-attracted to the negatively charged drum during the paper separation process. It also makes image transfer and paper separation easier.

7.2 IMAGE TRANSFER

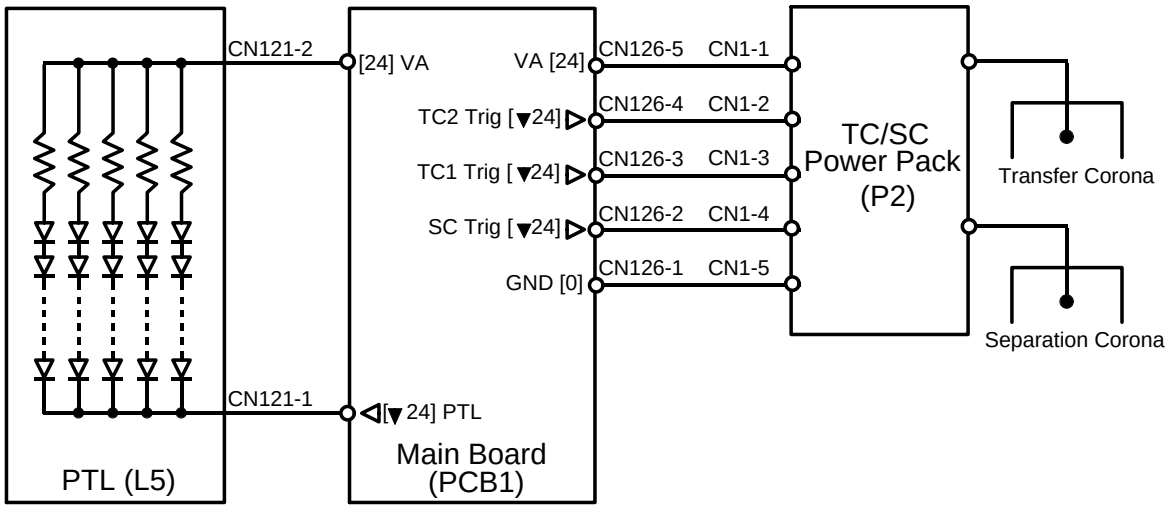
A high negative voltage (–4.8 kilovolts) is applied to the transfer corona wire [C], and the corona wire generates negative ions. These negative ions are applied to the copy paper, and the negative charge attracts the positively charged toner away from the drum and onto the paper. In addition, the paper is held against the drum by the positive counter charge on the drum.

7.3 PAPER SEPARATION

After image transfer the copy must be separated from the drum. To break the attraction between the paper and the drum, the separation corona wire [D] applies an ac corona to the reverse side of the paper. The stiffness and weight of the paper causes it to separate from the drum.

The negative charge on the paper (from the transfer corona) is not completely discharged until the paper is far enough from the drum that the toner will not be reattracted to the drum. The two pick-off pawls [E] ensure that thin, low stiffness paper and upward curled paper separate completely. The spurs [F] prevents the unfused toner on the paper from being smeared by the pick-off pawls.

7.4 PRE-TRANSFER LAMP AND TRANSFER/SEPARATION CORONA CIRCUIT



When the Start key is pressed, the main board outputs Low signals to turn on the pre-transfer lamp (PTL) and the TC/SC power pack for the transfer and separation coronas.

The pre-transfer lamp is composed of 50 LEDs supplied by +24 volts.

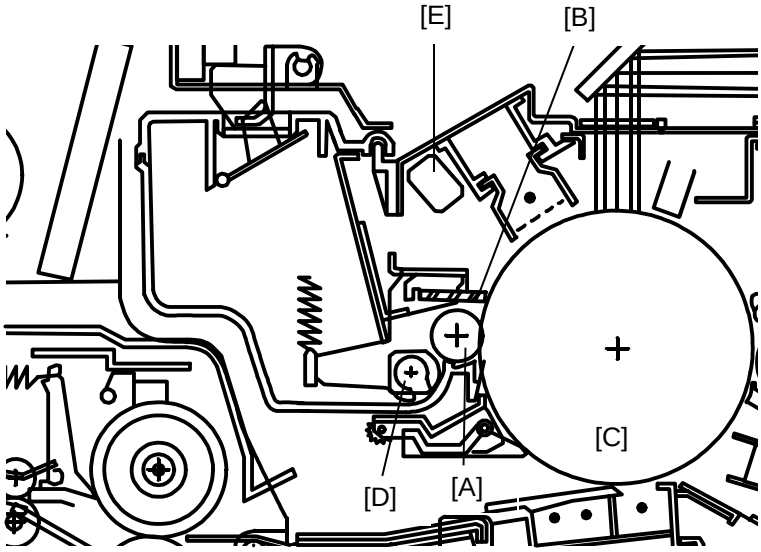
The TC/SC power pack has a dc to dc converter and a dc to ac inverter. The dc to dc converter changes +24 volts to -4.8 kilovolts for the transfer corona. The inverter changes +24 volts to the 5.0 kilovolts ac (500 Hz) for the separation corona.

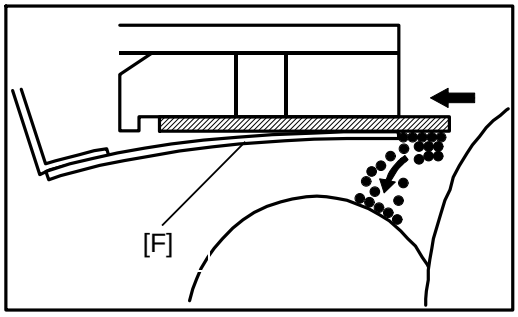
The TC2 trigger is only used for the second side copies in duplex copy mode. This shifts the corona current to increase transfer efficiency.

The separation corona circuit in the TC/SC power pack has a current leak detection circuit for safety. When this circuit detects that more than 2 milliampere is supplied to the separation corona, the separation corona turns off immediately. When the main switch is turned off and on, or the front cover or the exit cover is opened and closed, this condition is cleared.

8. DRUM CLEANING

8.1 OVERVIEW





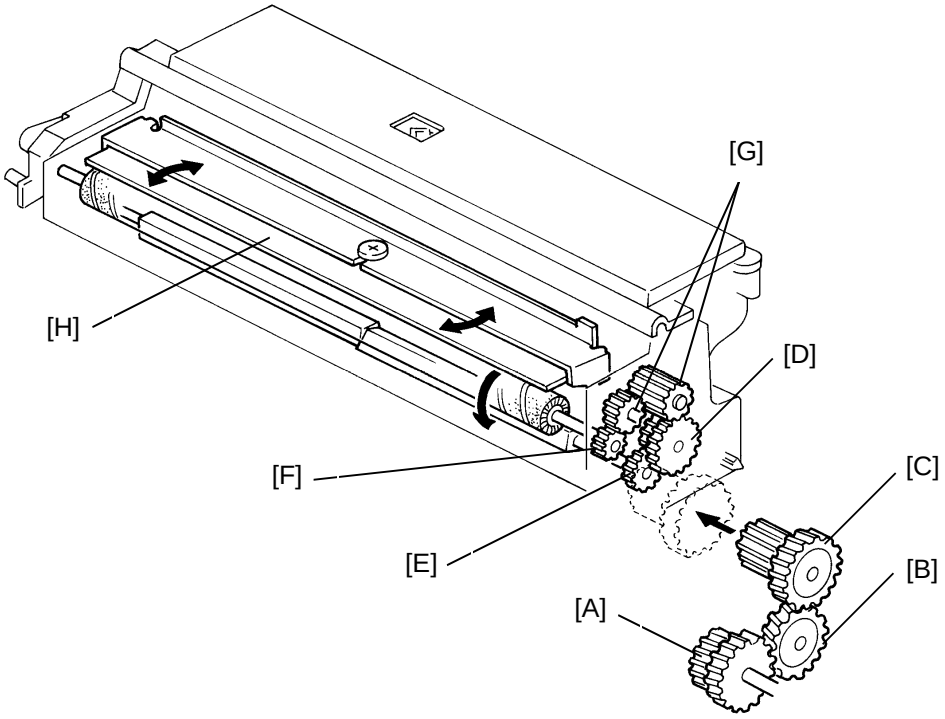
The cleaning brush [A] and cleaning blade [B] remove any toner remaining on the drum [C] after the image is transferred to the paper.

The cleaning brush and drum move in opposite directions at their point of contact. The cleaning brush removes paper dust and nearly half of the toner from the drum surface to reduce the cleaning load placed on the blade.

The cleaning blade removes the remaining toner. The falling toner catches in the fibers of the cleaning brush and is carried inside the cleaning unit. The toner collection roller [D] carries the used toner to the used toner tank. The light of the quenching lamp [E] neutralizes any charge remaining on the drum in preparation for the next copy cycle.

The cleaning blade releases when the release knob is pressed. This cleans the edge of the cleaning blade using the blade scraper [F], which is mounted under the cleaning blade.

8.2 DRIVE MECHANISM

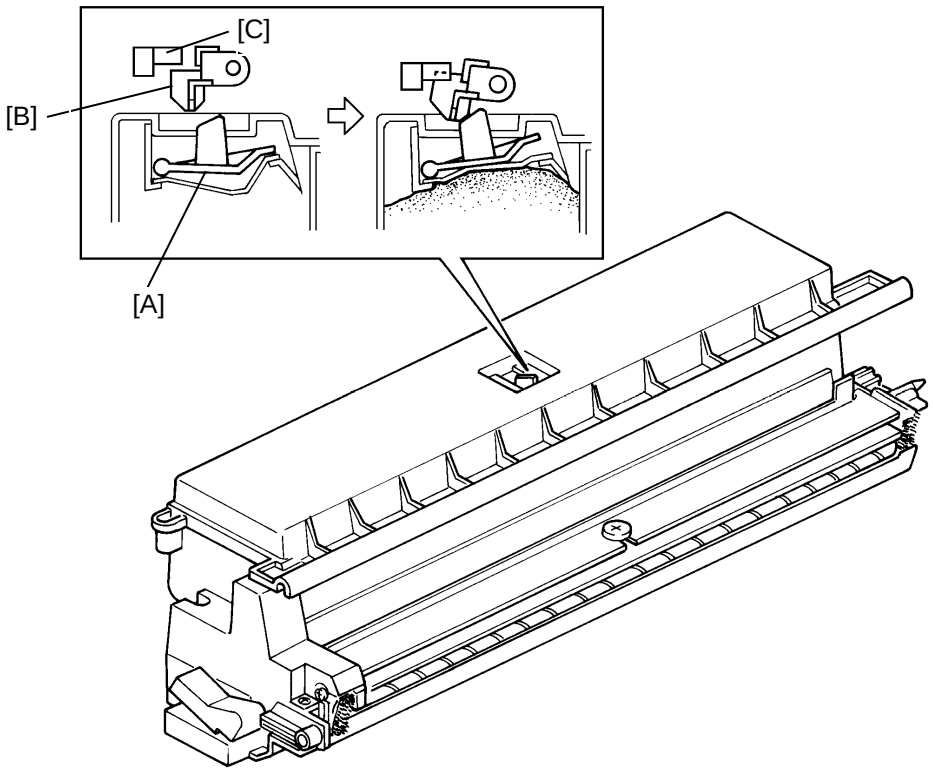


The rotation of the main motor is transmitted to the cleaning unit through the main motor gear [A], the relay gear [B], and the cleaning drive gear [C].

The gear [D] driven by the cleaning drive gear passes the rotation to the toner collection roller gear [E] and to the cleaning brush gear [F] through the idle gears [G].

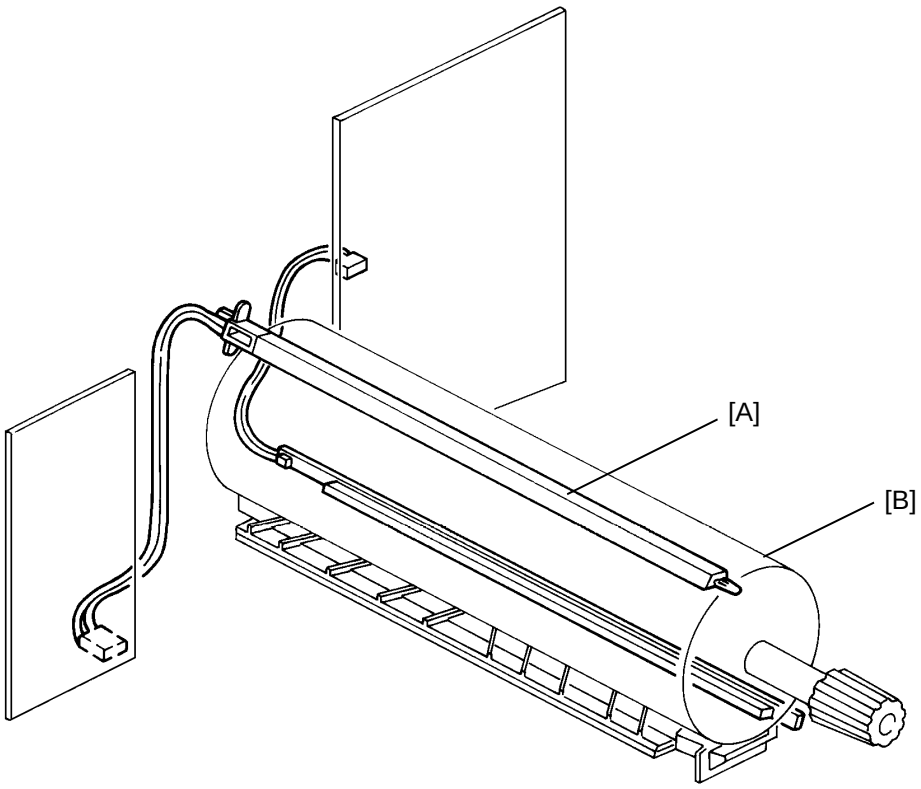
The cleaning blade [H] is mounted in the center of the blade and is tilted to apply even pressure.

8.3 TONER OVERFLOW DETECTION



The toner overflow detection mechanism stops copier operation when the used toner tank gets full. When the tank gets full, the pressure of the used toner pushes up a movable plate [A] mounted in the top of the used toner tank. As this plate moves up, it raises the toner overflow actuator [B]. When the actuator moves into the toner overflow sensor [C], the CPU starts to blink "E70" on the operation panel. After the "E70" starts to blink, 250 copies can be made. Then, after 250 copies the "E70" stops blinking (stays on) and copying is inhibited.

9. QUENCHING

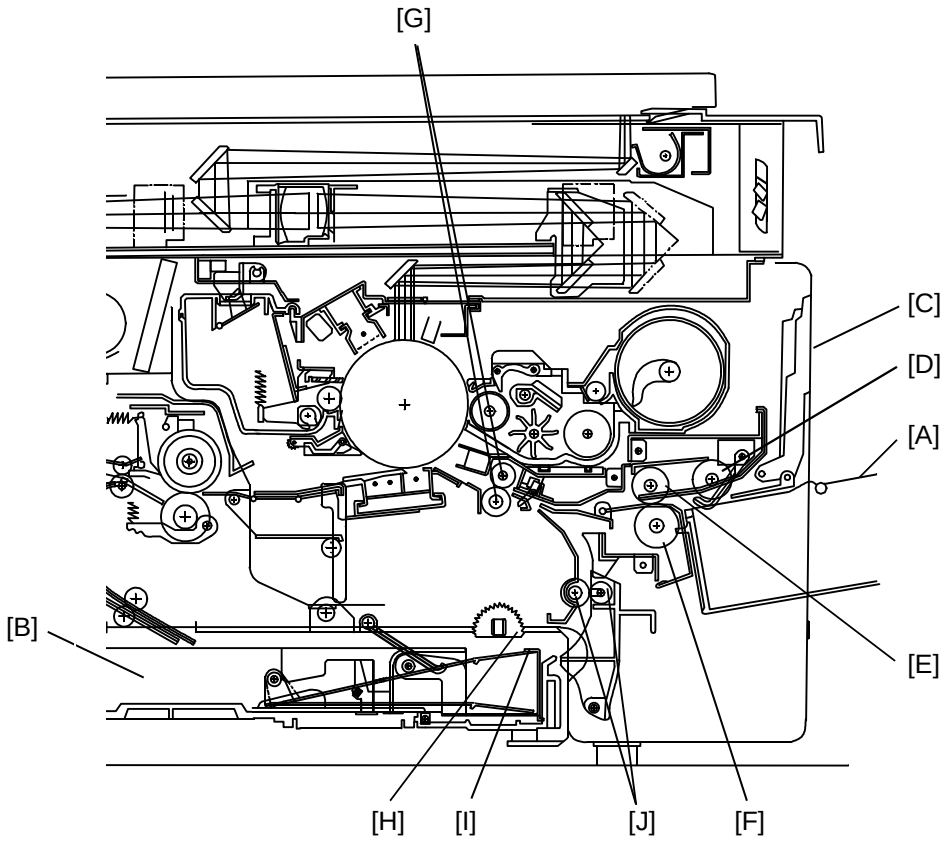


In preparation for the next copy cycle, light from the quenching lamp (QL) [A] neutralizes any charge remaining on the drum [B].

The neon lamp is used for quenching and it is turned on whenever the main motor rotates.

10. PAPER FEED AND REGISTRATION

10.1 OVERVIEW

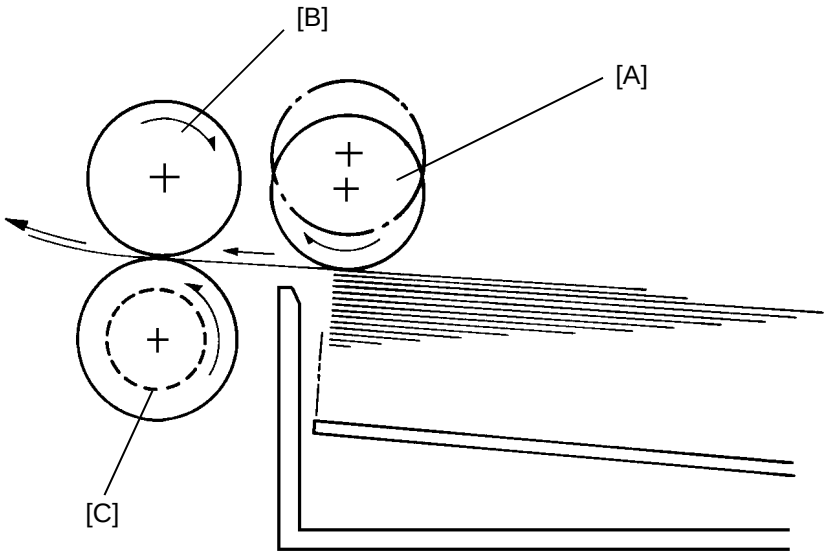


This model has two paper feed stations. The first feed station is located on the right side of the copier and the second feed station is located inside the copier. The first feed station uses a cassette [A] which can load 500 sheets, and the second feed station uses a drawer type tray [B] which can load 250 sheets. Paper can also be fed using the manual feed table [C], which utilizes the feed mechanism of the first feed station.

The first feed station uses a FRR feed system. Rotation of the pick-up roller [D] drives the top sheet of paper from the cassette to the feed and the reverse rollers. The feed [E] and reverse [F] rollers then take over the paper drive. If more than one sheet is fed by the pick-up roller, the reverse roller rotates in the opposite direction and prevents all but the top sheet from passing through to the registration rollers [G].

The second feed station uses the semicircular feed roller [H] and corner separator [I] system. The semicircular feed roller makes one rotation to drive the top sheet of paper to the relay rollers [J], which then feed the sheet to the registration rollers. The corner separator allows only one sheet to feed.

10.2 FRR FEED SYSTEM



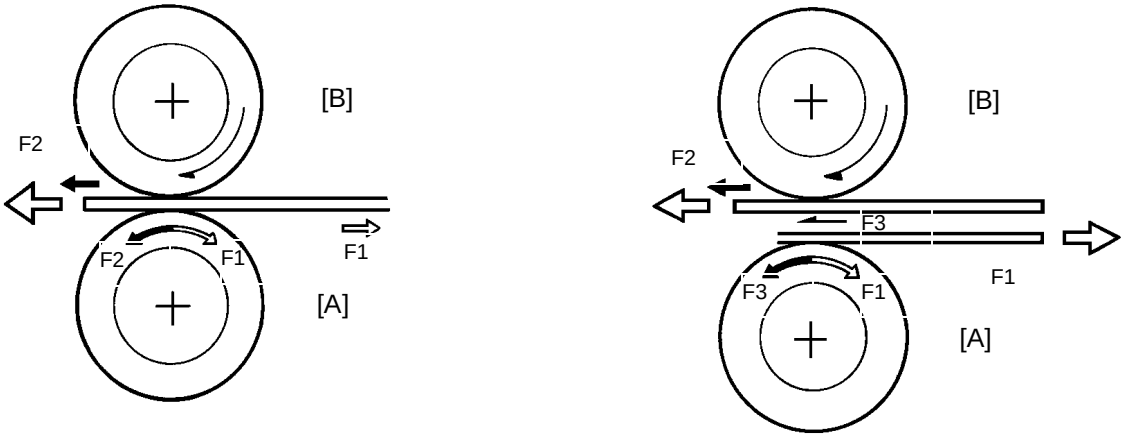
This copier uses an FRR (Feed + Reverse Roller) paper feed system which utilizes three rollers.

10.2.1 Pick-up Roller

The pick-up roller [A] is not in contact with the paper stack before it starts feeding paper. Shortly after the Start key is pressed, the pick-up roller drops down and feeds the top sheet between the feed [B] and the reverse rollers [C]. At almost the same time that the paper's leading edge arrives at the feed roller, the pick-up roller lifts off the paper stack so that it does not interfere with the operation of the feed and reverse rollers. The feed and reverse rollers then take over the paper feed process.

10.2.2 Feed and Reverse Rollers

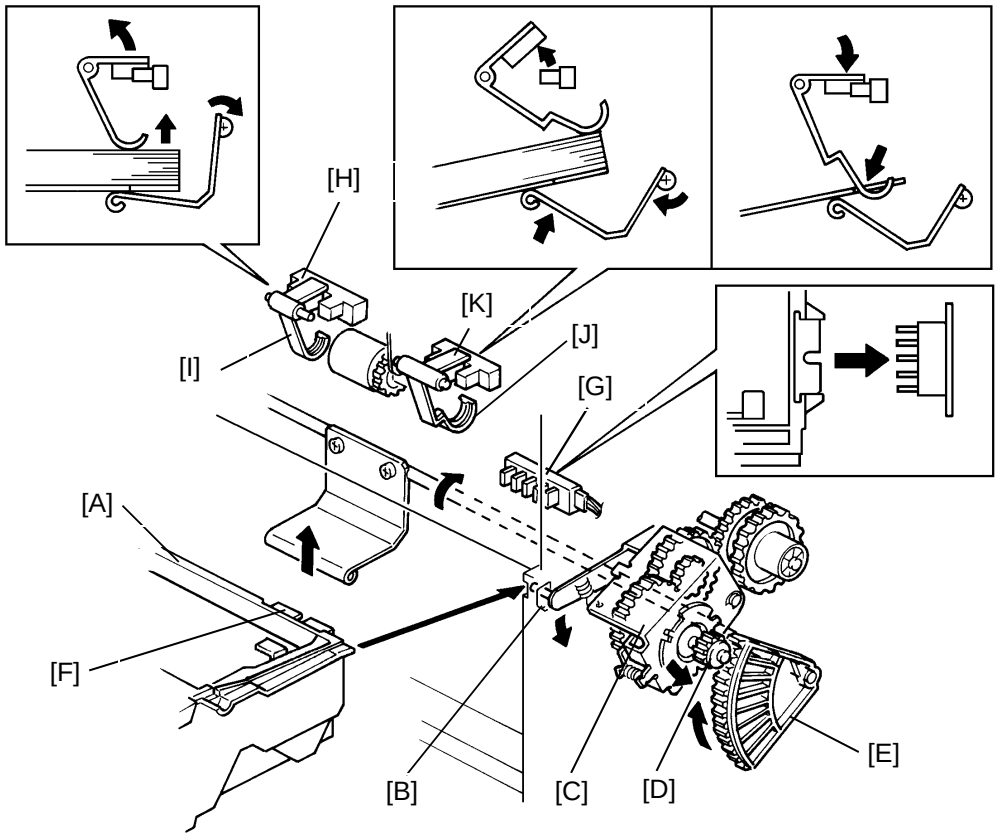
There is a one-way bearing inside the feed roller so it can turn only in one direction. The reverse roller is driven in the opposite direction to the feed roller. The reverse roller, however, is driven through a slip clutch (torque limiter clutch) which allows it to turn in either direction depending on the friction between the rollers. A spring keeps the reverse roller in contact with the feed roller.



The direction that the reverse roller [A] turns depends on the frictional forces acting on it. The slip clutch applies a constant clockwise force (F1). When there is a single sheet of paper being driven between the rollers, the force of friction between the feed roller [B] and the paper (F2) is greater then F1. So, the reverse roller turns counterclockwise.

If two or more sheets are fed between the rollers, the forward force on the second sheet (F3), becomes less than F1 because the coefficient of friction between the two sheets is small. So, the reverse roller starts turning clockwise and drives the second sheet back to the cassette.

10.3 1ST FEED STATION PAPER LIFT MECHANISM AND PAPER END DETECTION



10.3.1 Paper Lift Mechanism

When the cassette [A] is inserted into the copier, the cassette actuator pin [B] is pushed down by the cassette. The paper lift clutch unit [C] moves down and then the paper lift gear [D] engages with the sector gear [E]. Simultaneously, the paper size actuator [F] actuates the paper size switch [G].

Under the following conditions, the CPU checks the paper lift sensor [H] to see if the paper is at the feed position:

1. When the Start key is pressed.
2. When the warm-up condition changes to the ready condition.
3. When the manual feed table is closed.

If the paper has not been raised to the feed position, the CPU turns on the main motor and the paper lift clutch. The paper lift gear turns the sector gear and the bottom plate raises until the top sheet pushes up the paper lift sensor feeler [I]. When the paper lift sensor is de-actuated, the paper lift sensor sends a Low signal to the main board, and then the main motor and the paper lift clutch are turned off.

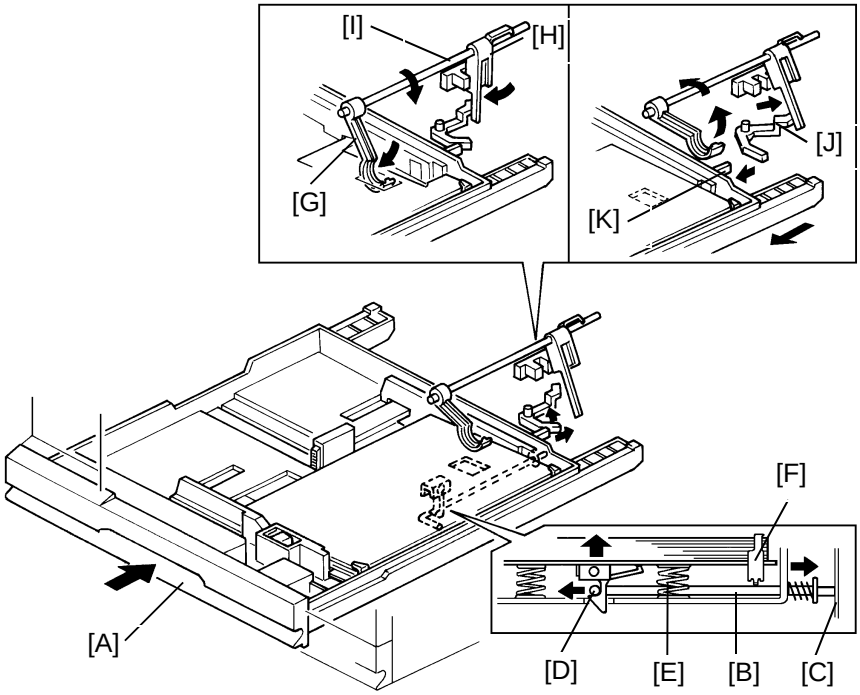
If the tray lift sensor stays HIGH for 7 seconds after the paper lift clutch is turned on, "U5" lights in the operation panel.

As paper is fed into the copier, the level of paper stack gets lower. If the level becomes too low, the paper lift sensor is actuated and the CPU energizes the paper lift clutch until the top sheet raises the feeler to de-actuate the paper lift sensor again. This ensures that the paper is always at the correct feed height.

10.3.2 Paper End Detection

When the cassette runs out of paper, the paper end feeler [J] drops through a slot in the cassette bottom plate. As it drops, the paper end sensor [K] is actuated by the feeler. The paper end sensor then sends a HIGH signal to the main board. The Add Paper indicator then turns on. The Wait indicator keeps turning on and the machine stops after the copy cycle is finished.

10.4 2ND FEED STATION PAPER LIFT MECHANISM AND PAPER END DETECTION



10.4.1 Paper Lift Mechanism

When the paper tray [A] is closed after the paper is loaded, the release shaft [B] is pushed by the rear frame [C] and releases the lock arm [D], which is mounted on the paper tray bottom plate.
Once the lock arm is released, the pressure spring [E] lifts the bottom plate and the top sheet pushes up the corner separator [F] and stops at the correct feed height.

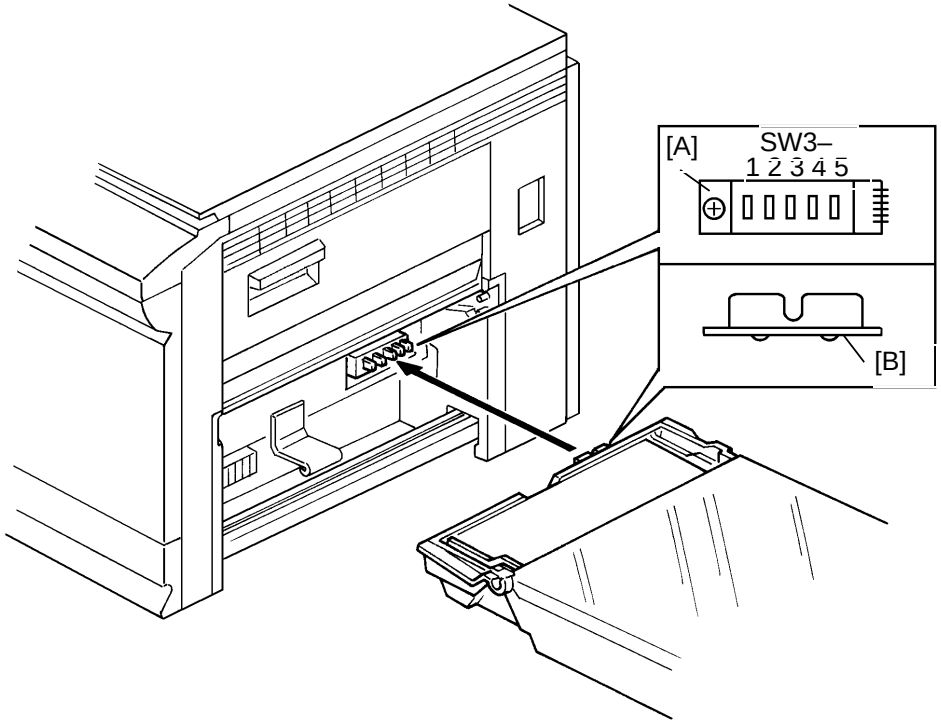
10.4.2 Paper End Detection

When the paper tray runs out of paper, the paper end feeler [G] drops through a slot in the tray bottom plate. The paper end actuator [H], which is on the same shaft as the paper end feeler, pivots into the paper end sensor [I]. The paper end sensor sends a HIGH signal to the main board and then the Add Paper indicator turns on. The Wait indicator keeps turning on and the machine stops after the copy cycle is finished.

When the paper tray is pulled out, the release arm [J], which is spring loaded, turns clockwise and raises the paper end actuator and the paper end feeler. This prevents the paper end feeler from being damaged by the paper tray. When the paper tray is closed, the projection [K] on the paper tray pushes the release arm to release the paper end actuator and the paper end feeler.

10.5 PAPER SIZE DETECTION

10.5.1 1st Feed Station



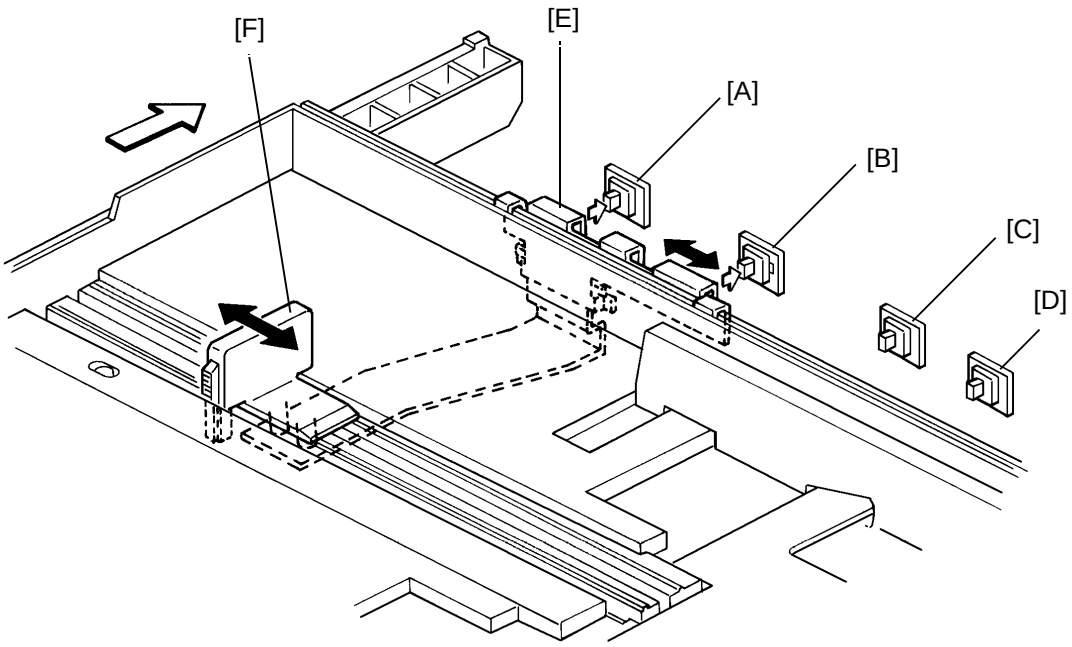
The paper size switch (SW3) [A] in the cassette entrance detects the paper size. The paper size switch has five microswitches (SW3-1 through 3-5) inside. The paper size switch is actuated by an actuator plate [B] on the rear of the cassette. Each paper size has its own unique combination of notches in the plate. The CPU receives a LOW signal from the microswitches activated by the actuator and determines which cassette was inserted.

Paper Size Detection Table (1st Feed Station)

Paper Size	Switch 3 – 1	2	3	4	5	Size Indication
Universal	0	0	0	0	0	*
A3	1	0	0	0	0	A3
B4	1	1	0	0	0	B4
A4	0	0	1	0	0	A4
A4	1	0	1	0	0	A4
B5	0	1	1	0	0	*
B5 (lengthwise)	1	1	1	0	0	*
A5 (sideways)	0	0	0	1	0	A5
A5 (lengthwise)	1	0	0	1	0	A5
B6 (sideways)	0	1	0	1	0	*
B6 (lengthwise)	1	1	0	1	0	*
Return Post Card	0	0	1	1	0	*
Post Card	1	0	1	1	0	*
11" x 17"	0	0	0	0	1	11 x 17
11" x 8 1/2"	1	0	0	0	1	8 1/2 x 11
11" x 15"	0	1	0	0	1	*
10" x 14"	1	1	0	0	1	*
8 1/2" x 14"	0	0	1	0	1	8 1/2 x 14
8 1/2" x 13"	1	0	1	0	1	*
8 1/2" x 11"	0	1	1	0	1	8 1/2 x 11
8 1/2" x 5 1/2"	1	1	1	0	1	5 1/2 x 8 1/2
8 1/4" x 13" (14")	0	0	0	1	1	*
F (8" x 13")	1	0	0	1	1	F
8" x 10 1/2"	0	1	0	1	1	*
8" x 10"	1	1	0	1	1	*
5 1/2" x 8 1/2"	0	0	1	1	1	5 1/2 x 8 1/2
No Cassette	1	1	1	1	1	

0: Low (ON)
1: High (OFF)

10.5.2 2nd Feed Station



Four paper size switches (SW4 [A], SW5 [B], SW6 [C], and SW7 [D]) on the rear frame detect the paper size. The paper size switches are actuated by an actuator plate [E] on the rear of the paper tray. The paper end guide [F] is connected to the actuator plate. When the paper end guide is pushed against the paper stack loaded in the cassette, the actuator plate slides into position and actuates the appropriate paper size switch.

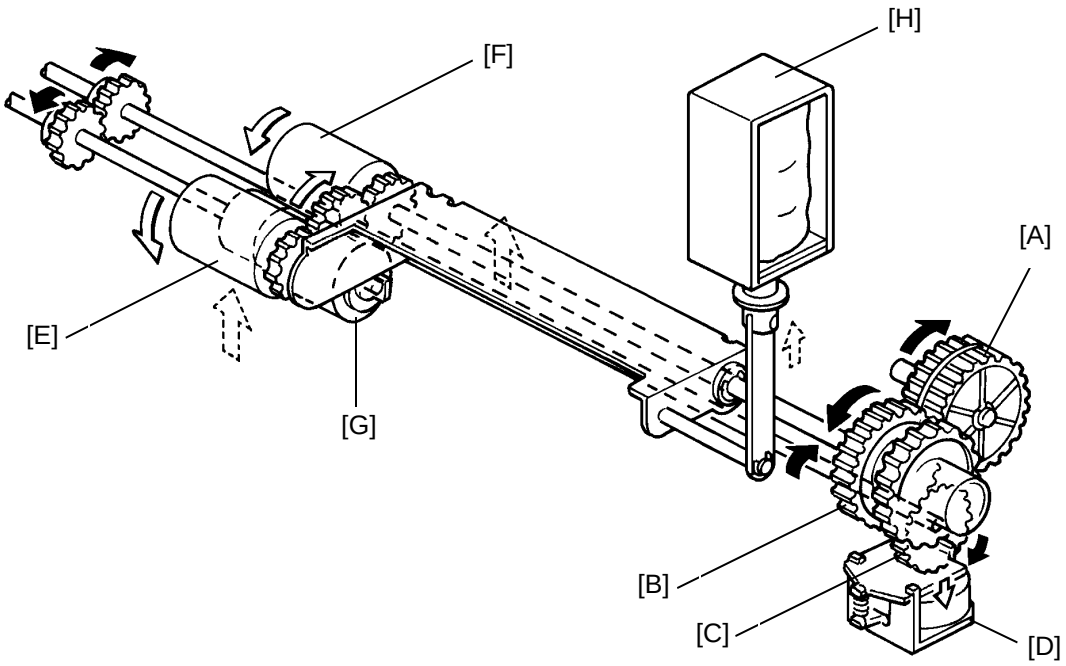
Paper Size Detection Table (2nd Feed Station)

Paper Size	Switch 4	5	6	7	Size Indication
A3	0	1	1	1	A3
F (8" x 13")	1	0	1	1	F
A4 lengthwise	1	0	0	1	A4
A4 sideways	1	1	0	1	A4
B4	0	0	1	1	B4
11" x 17"	0	1	1	1	11" x 17"
11" x 8 1/2"	1	1	1	0	8 1/2" x 11"
8 1/2" x 11"	1	1	0	1	8 1/2" x 11"
8 1/2" x 14"	1	0	1	1	8 1/2" x 14"
	0	0	0	0	Duplex Unit

0: Low (ON)
1: High (OFF)

10.6 PAPER FEED DRIVE MECHANISM

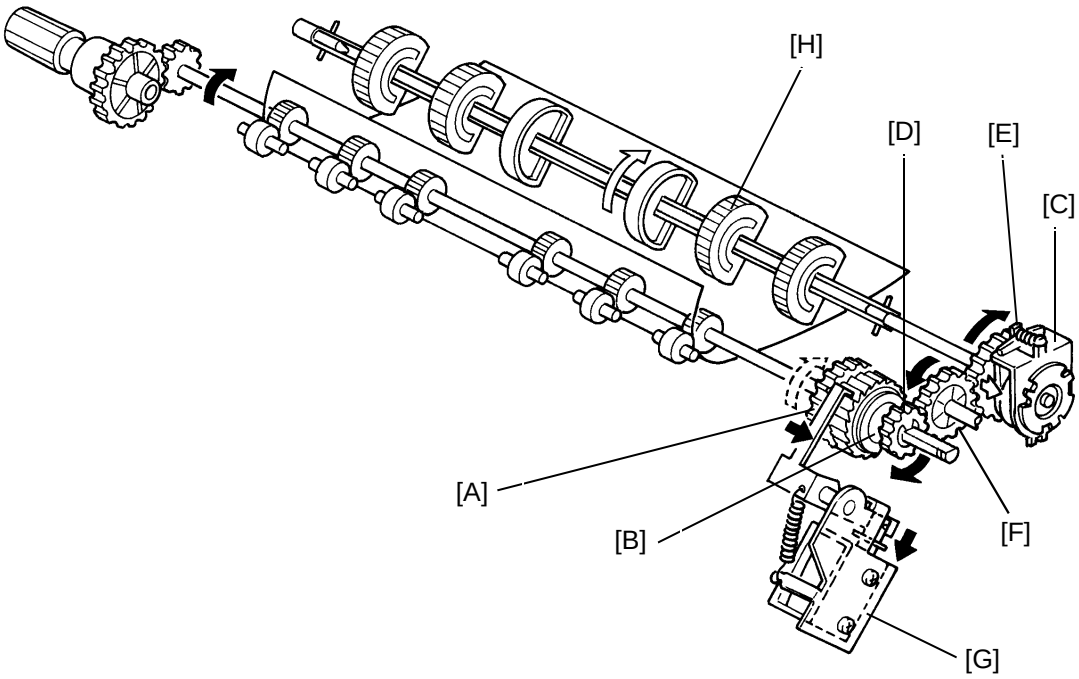
10.6.1 1st Feed Station



Through several gears and a timing belt, main motor rotation is transmitted to the relay gear [A] and then the 1st paper feed clutch gear [B]. The 1st paper feed clutch gear turns the reverse roller drive gear [C]. The paper feed timing is controlled by the 1st paper feed clutch [D].

The pick-up roller [E] is normally in contact with the paper stack. When the leading edge of the paper passes between the feed roller [F] and the reverse roller [G], the pick-up roller is then lifted up by the pick-up roller release solenoid [H]. After the trailing edge of the paper passes under the pick-up roller, the pick-up roller release solenoid is de-energized and the pick-up roller drops back onto the paper stack in preparation for the next copy cycle.

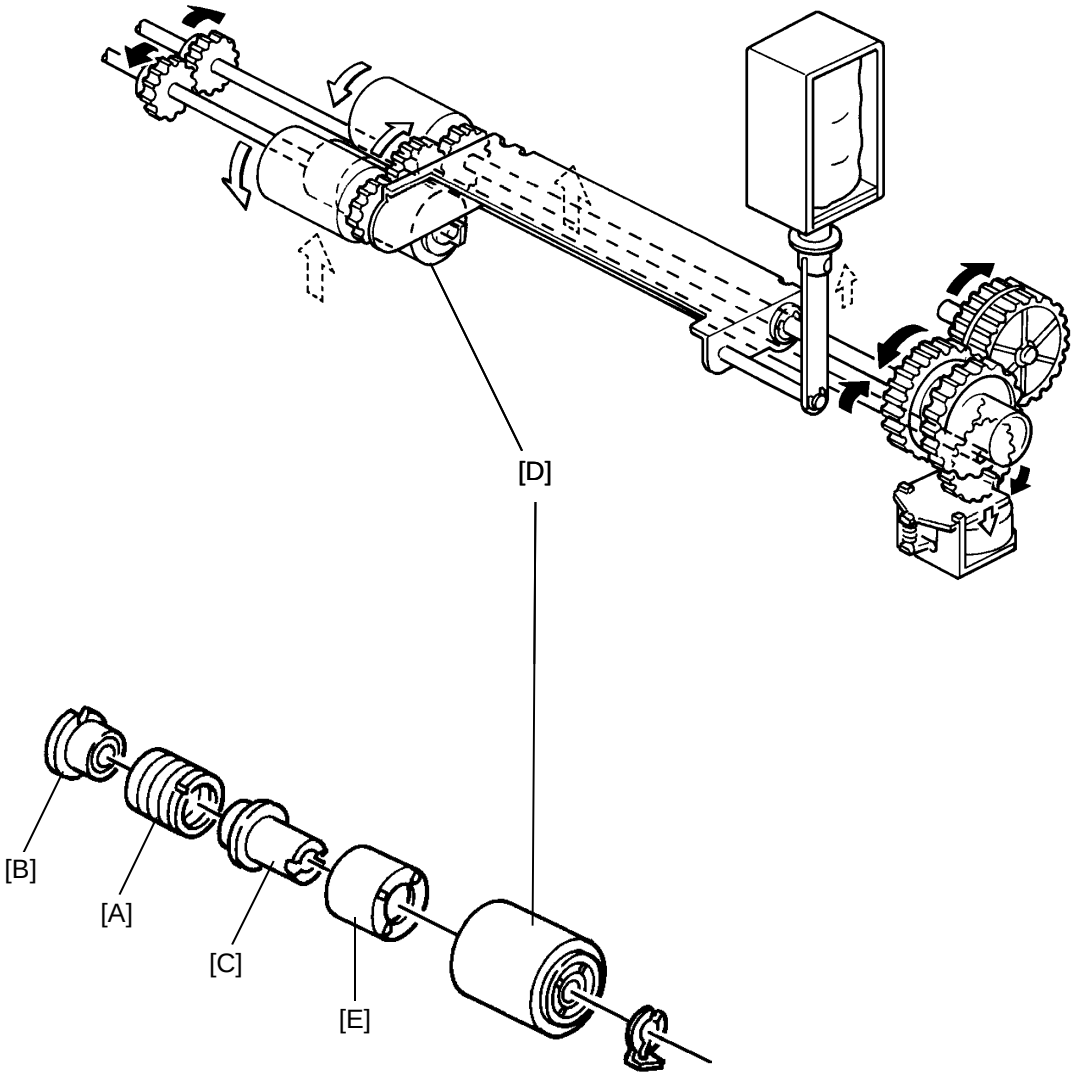
10.6.2 2nd Feed Station



Main motor rotation is transmitted to the relay roller clutch gear [A] through gears and a timing belt. The paper feed timing is controlled by the relay roller clutch [B] and the 2nd feed clutch [C]. The relay roller gear [D] transmits rotation to the 2nd feed clutch gear [E] through the relay gear [F] only when the relay roller clutch is on (when the relay clutch solenoid [G] is energized).

Both the relay roller clutch and the 2nd paper feed clutch turn on at the same time to start paper feed. The 2nd feed clutch is energized for 500 milliseconds to transfer drive to the 2nd feed roller shaft and turns the 2nd feed rollers [H]. The 2nd feed rollers stop turning when the 2nd feed clutch gear completes one rotation. The relay roller clutch solenoid stays energized until the leading edge of the paper reaches the registration rollers.

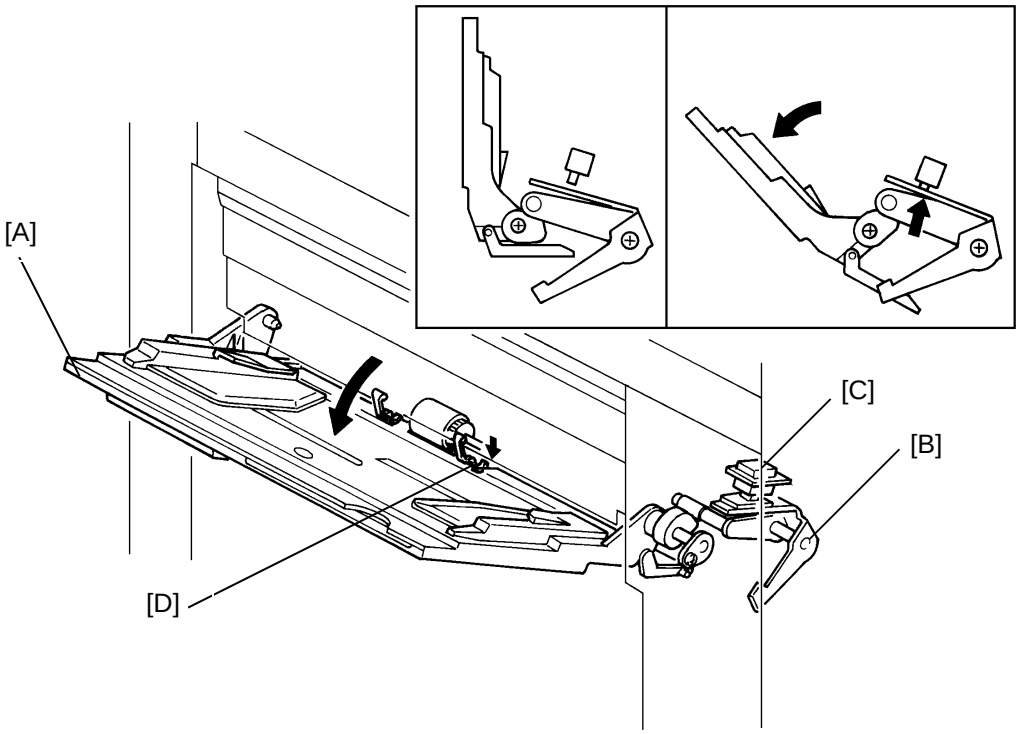
10.7 SLIP CLUTCH MECHANISM



[D]: Reverse Roller
[E]: Slip Clutch Cover

The slip clutch consists of two hubs connected by a drive spring [A]. The spring grips the input hub [B] loosely and grips the output hub [C] tightly. It will slip if the resistance to rotation is too great. The hubs and spring are precisely machined, and the output hub and spring slip when a single sheet of paper feeds between the feed roller and reverse roller.

10.8 MANUAL FEED TABLE

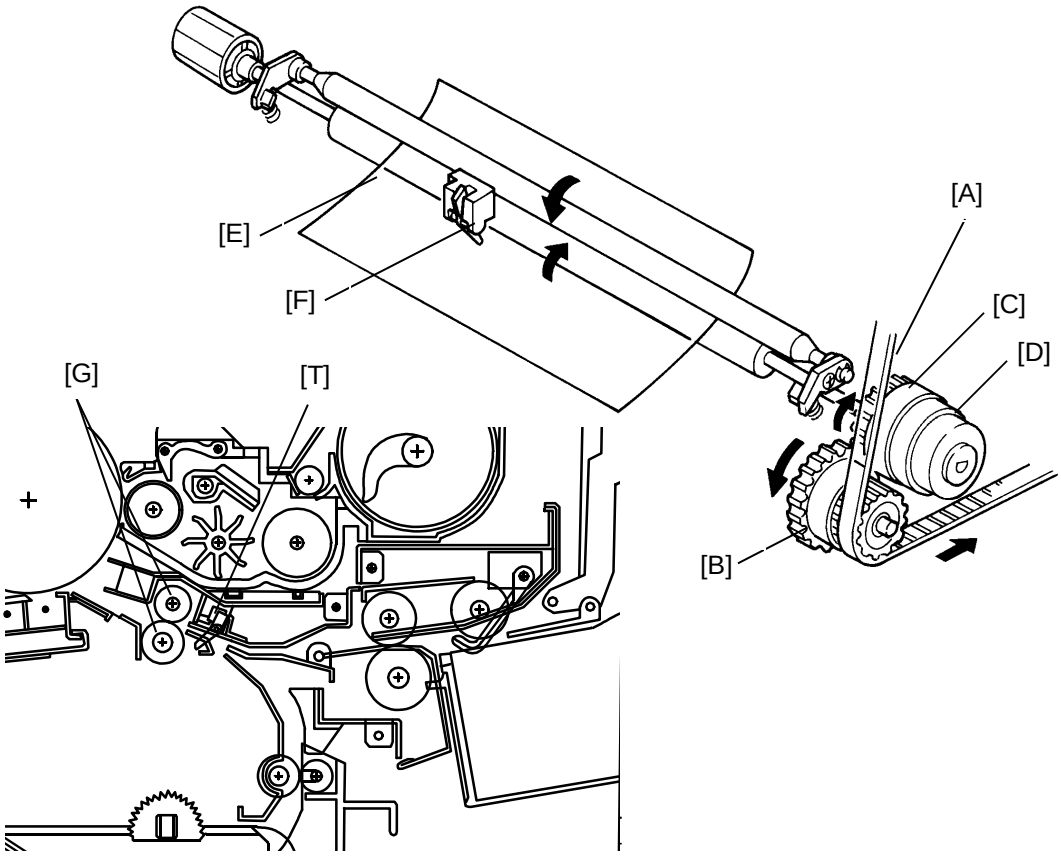


The manual feed table [A] uses the same feed mechanism as the first feed station and a maximum of 50 sheets of standard weight paper can be loaded. When the manual feed table is opened, a release lever [B] activates the manual feed table switch (SW9) [C] and releases the paper lift-up clutch unit mechanically to drop down the cassette bottom plate. At the same time the pick-up roller release solenoid turns on to release the pick-up roller and the paper end feeler [D] drops down into a slot in the manual feed table and the Add Paper indicator lights.

The manual feed table switch sends a LOW signal to the main board so that the Manual Feed indicator turns on and the pick-up roller is lifted up.

When paper is loaded onto the manual feed table, the paper end sensor is de-actuated and the Add Paper indicator turns off.

10.9 PAPER REGISTRATION



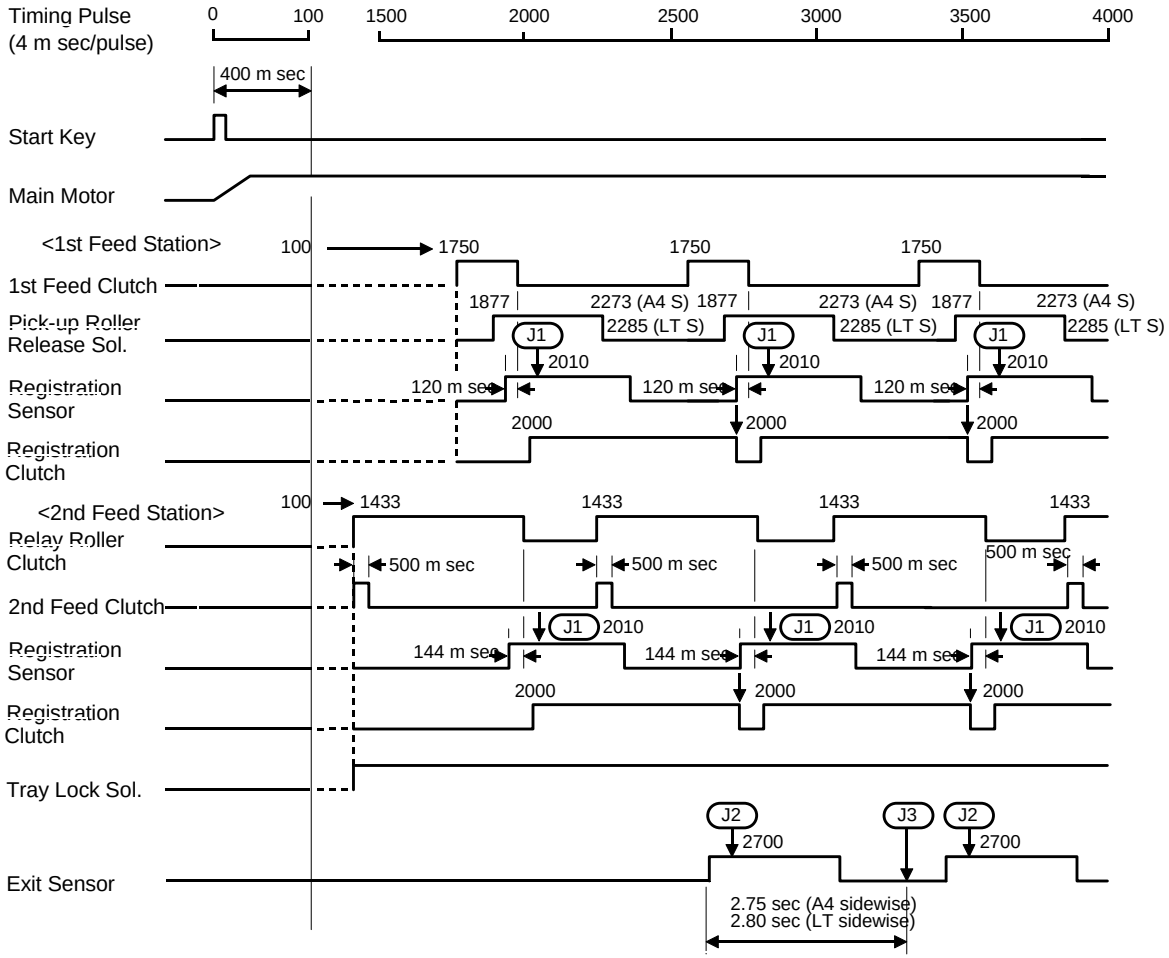
Main motor rotation is transmitted to the timing belt [A] through a series of gears. The timing belt rotate the relay gear [B] and then the registration roller clutch gear [C]. When the registration clutch [D] is energized, the rotation of the clutch gear is transmitted to the lower registration roller [E].

The registration rollers can be rotated by a knob in the front to ease misfed paper removal.

The registration sensor [F], which is positioned just before the registration rollers [G], controls the paper feed stop timing. The 1st paper feed clutch stays on for 120 milliseconds and the relay roller clutch (2nd feed station) stays on 144 milliseconds after the leading edge of paper actuates the registration sensor. At the end of the period, the CPU turns off the 1st paper feed clutch or the relay roller clutch. This delay allows time for the paper to press against the registration rollers and buckle slightly to correct skew.

The CPU energizes the registration clutch 1.4 seconds after the Start key is pressed. The registration rollers then feed the paper to the image transfer section.

10.10 PAPER FEED AND MISFEED DETECTION TIMING



PAPER FEED AND MISFEED DETECTION TIMING

The registration sensor and the exit sensor monitor the movement of the paper through the paper path. If the CPU determines that a misfeed exists, the Check Paper Path and the Misfeed Location indicators turn on. When the main switch is turned on, the CPU checks these two sensors for initial misfeed. During the copy cycle, the CPU performs three kinds of misfeed detection:

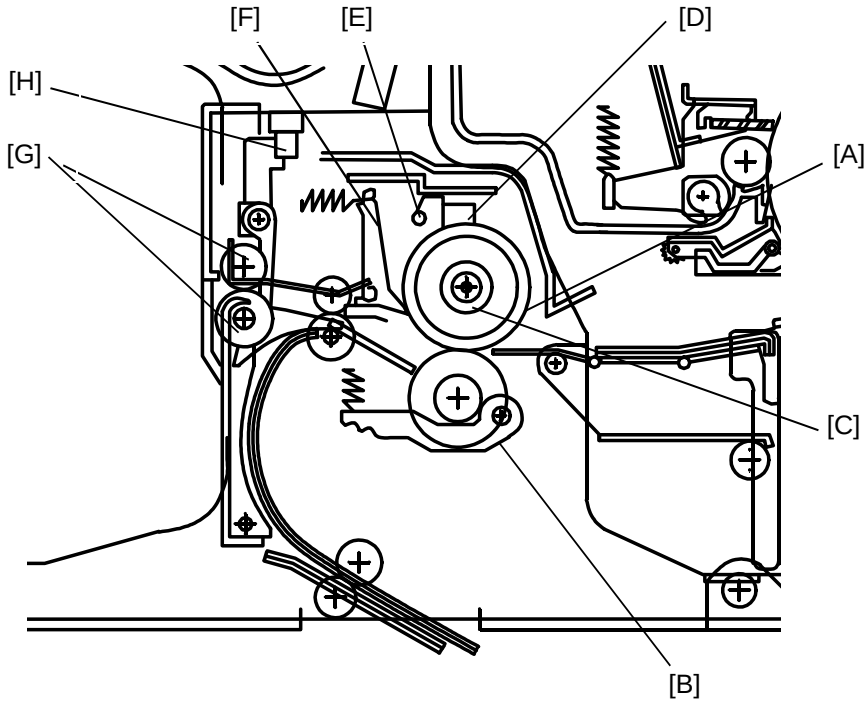
J1: Checks whether the registration sensor is actuated within 10 pulses (40 milliseconds) after the registration clutch turns on. (The Misfeed Location indicator "A" or "B" turns on.)

J2: Checks whether the exit sensor is actuated within 700 pulses (2.8 seconds) after the registration clutch turns on. (The Misfeed Location indicator "C" turns on.)

J3: Checks whether the copy paper has passed through the exit sensor 2.75 (A4 sideways) or 2.80 (Letter sideways) seconds after the exit sensor has been actuated. (The Misfeed Location indicator "D" turns on.)

11. IMAGE FUSING

11.1 OVERVIEW

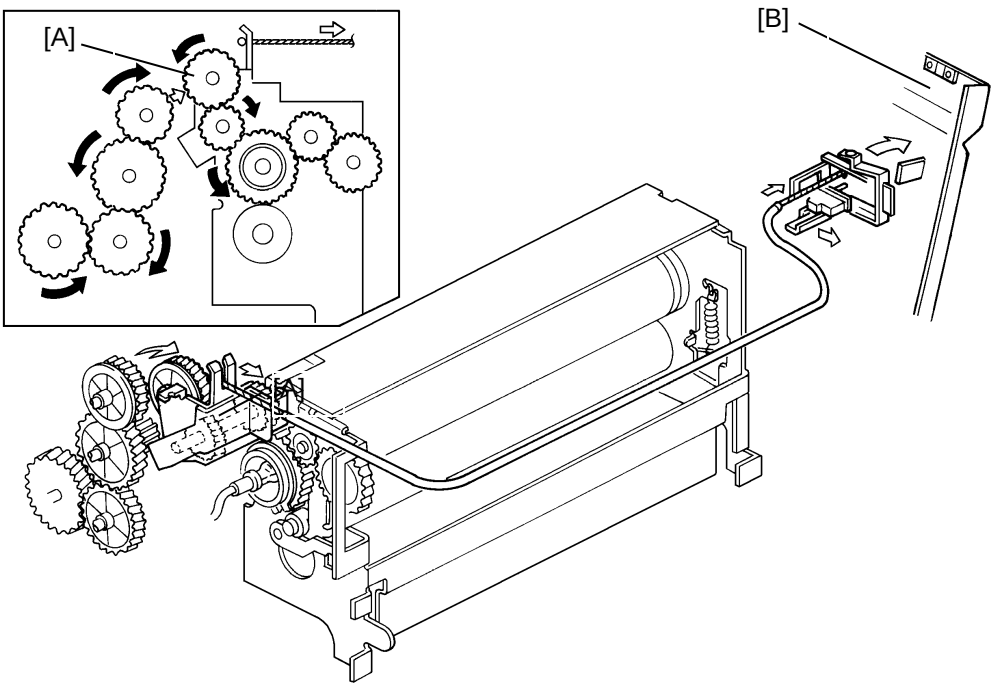


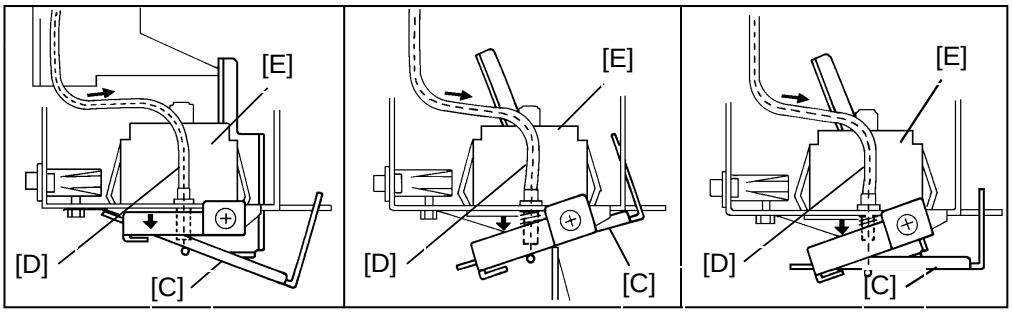
After the image is transferred, the copy paper enters the fusing unit. There the image is fused to the copy paper by the process of heat and pressure through the use of a hot roller [A] and pressure roller [B].

The fusing lamp [C] located inside the hot roller is turned on and off to maintain the operating temperature of 185 ^{O}C. The CPU monitors the hot roller surface temperature through a thermistor [D] which is in contact with the hot roller's surface. A thermofuse [E] protects the fusing unit from overheating.

The hot roller strippers [F] separate the copy paper from the hot roller and direct it to the exit rollers [G]. The exit sensor [H] monitors the progress of the copy paper through the fusing unit and acts as a misfeed detector while the exit rollers drive the copy paper to the copy tray. When the sorter is installed, the paper sensor on the sorter also functions as a misfeed detector.

11.2 FUSING DRIVE RELEASE MECHANISM AND COVER SAFETY SWITCH





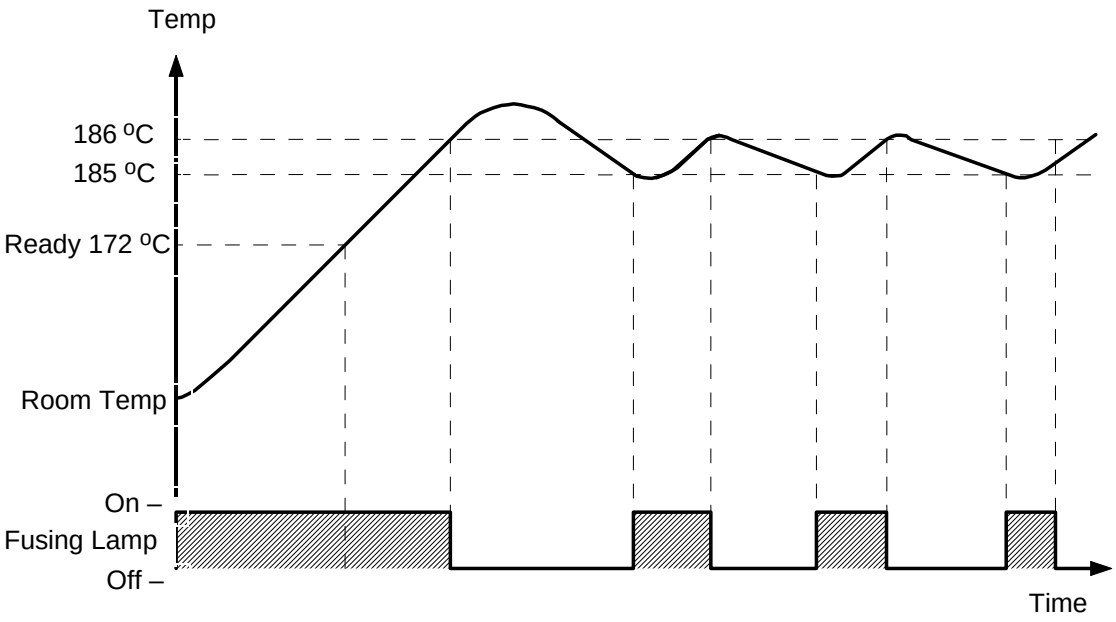
The front cover is opened. The exit cover is opened. The front cover and exit cover are opened.

The fusing unit drive release mechanism automatically disengages the fusing unit drive gear [A] when the front cover [B] or the exit cover is opened. This allows the fusing unit drive gear to rotate freely so that misfed paper can be easily removed.

When the front cover and/or the exit cover is opened, the actuator plate [C] pulls release wire [D] and the fusing unit drive gear is disengaged.

The actuator plate also releases the cover safety switch [E] removing all power from the copier and the optional peripherals.

11.3 FUSING LAMP CONTROL



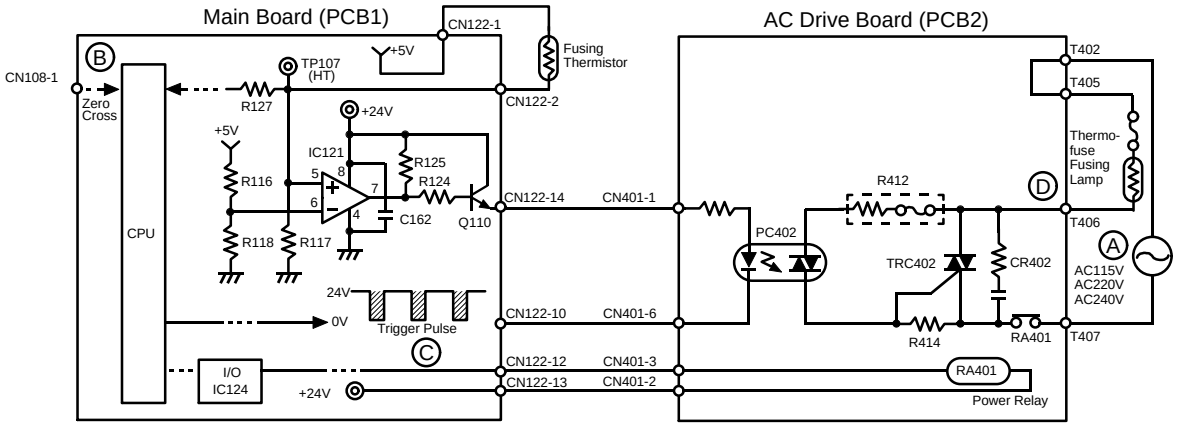
When the main switch is turned on, the CPU starts sending a trigger pulse to the fusing control circuit. The fusing control circuit then applies power to the fusing lamp. The power is applied until the CPU detects the ready temperature (172 °C) through the fusing thermistor. This should take less than 60 seconds. Once the CPU detects the ready temperature, the CPU changes the timing of the fusing lamp on/off check (checks whether the fusing lamp should be turned on or off) from every 1 second to every 5 seconds.

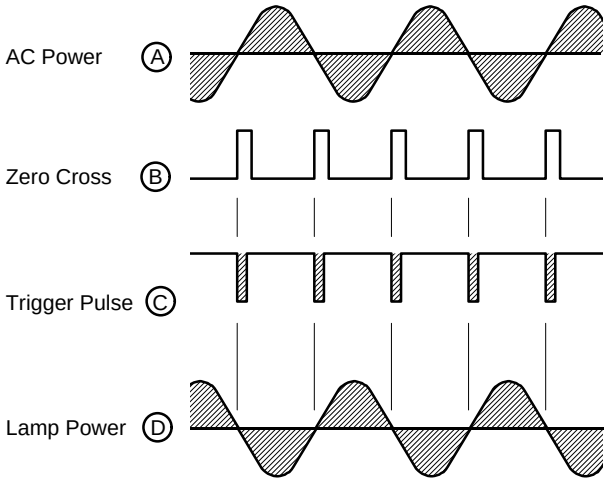
During warm-up, the thermistor's temperature lags behind the real hot roller's temperature. As a result, when the thermistor senses the ready temperature, the hot roller is already at or near the operating temperature. At this time the Ready indicator turns on.

After that, the trigger pulse is turned on constantly when thermistor detects a temperature less than 185 °C, and is turned off when the thermistor detects 186 °C.

If the fusing lamp (700W) is turned on or off when the exposure lamp is on, the power supplied to the exposure lamp will fluctuate, possibly degrading the copy image. To prevent this, the fusing lamp does not switch during scanning; it stays either on or off.

11.4 FUSING LAMP CONTROL CIRCUIT



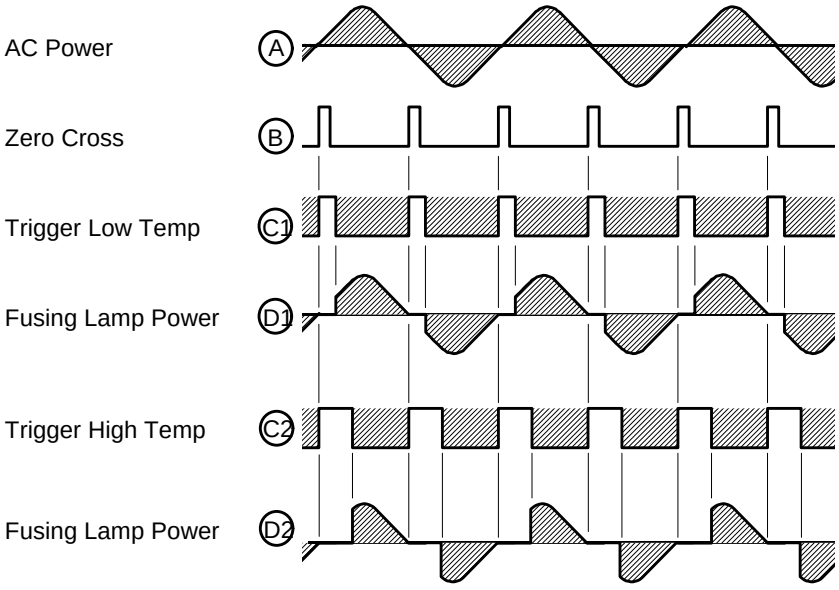


The main board monitors the fusing temperature through a thermistor. It also uses the zero cross signal generated by the dc power supply board to accurately control the applied power.

Normally, the voltage applied to the lamp is a full ac waveform. However, through SP mode #29, fusing power can be phase controlled. (Normally, phase control is used only if the customer has a problem with electrical noise or interference.)

When the main switch is turned on, the main board starts to output a trigger pulse [C], which has the same timing as the zero cross signal [B], to the ac drive board. This trigger pulse allows maximum ac power to be applied to the fusing lamp. When the operating temperature is reached, the CPU stops outputting the trigger pulse (trigger goes HIGH) and the fusing lamp turns off.

11.4.1 Phase Control Mode



The main board sends the fusing lamp trigger pulse (LOW active) [C] to the ac drive board. PC402 activates TRC402, which provides ac power to the fusing lamp at the trailing edge of each trigger pulses. The trigger pulse goes HIGH when the main board receives the zero cross signal.

The amount of time that power is applied to the fusing lamp [D] depends on the temperature of the hot roller.

The trigger pulse (LOW part) is wider [C1] when the hot roller temperature is lower, and it is narrower [C2] when the hot roller is near the operating temperature.

11.4.2 Overheat Protection

IC121 and Q110 form an overheat protection circuit. When the fusing lamp is controlled within the normal range, pin 7 of IC121 stays LOW; therefore, Q110 stays on, allowing PC402 to operate. If the hot roller temperature reaches 240 ^{o}C, the resistance of the thermistor becomes too low. At that time, pin 7 of IC121 becomes HIGH, turning off Q110 and stopping PC402. At the same time "E53" lights on the operation panel and the power relay (RA401) turns off.

Even if the thermistor overheat protection fails, a thermofuse is installed in series with the fusing lamp. If the thermofuse temperature reaches 169 ^{o}C, the thermofuse opens, removing power from the fusing lamp.

11.5 SERVICE CALL CONDITIONS

Service Code 52: Fusing Warm-up Error
The temperature detected by the thermistor does not reach 175 °C within 100 seconds after the main switch is turned on.

Service Code 53: Fusing Overheat
The temperature detected by the thermistor becomes higher than 240 °C.

Service Code 55: Fusing Thermistor Open
The temperature detected by the thermistor does not reach 2 °C within 30 seconds after the main switch is turned on.

When these service call conditions occure, for safety reason can not be cleared by turning off/on the main switch. The following procedure must be performed to clear these service call conditions:

1. Turn on the main switch.
2. Turn DIP switch 101-1 on and off.
3. Turn the main switch off and on.

NOTE: If the cause of the service call condition is not removed, the service code will be displayed again after this procedure.

SECTION 3
INSTALLATION

1. INSTALLATION REQUIREMENTS

1.1 ENVIRONMENT

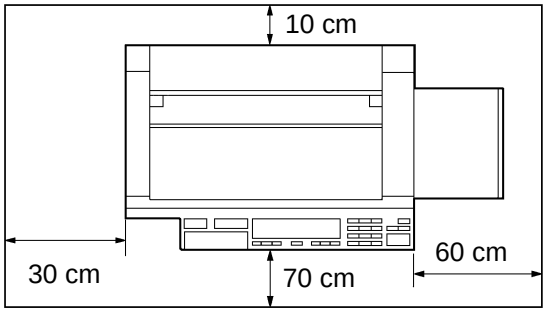
1. Temperature Range: 10°C to 30°C (50°F to 86°F)
2. Humidity Range: 15% to 90% RH
3. Ambient Illumination: Less than 1,500 lux (do not exposure to direct sunlight)
4. Ventilation: Room of more than 30 m^3. Room air should turn over at least 3 times/hour.
5. Ambient Dust: Less than 0.15 mg/m^3 (4×10^{-3} oz/yd^3)
6. If the installation place is air-conditioned or heated, place the machine as follows:
   a) Where it will not be subjected to sudden temperature changes.
   b) Where it will not be directly exposed to cool air from an air-conditioner in the summer.
   c) Where it will not be directly exposed to reflected heat from a space heater in winter.
7. Avoid placing the machine in an area filled with corrosive gas.
8. Avoid any places higher than 2,000 meters (6,500 feet) above sea level.
9. Place the machine on a strong and level base.
10. Avoid any area where the machine may be subjected to frequent strong vibration.

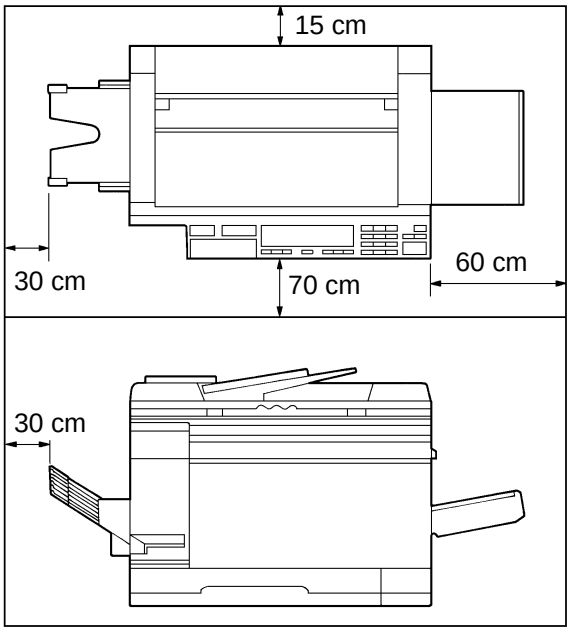
1.2 MACHINE LEVEL

1. Front to back: Within 5 mm (0.2") of level
2. Right to left: Within 5 mm (0.2") of level

Make sure that the machine is level using a carpenter's level.

1.3 MINIMUM SPACE REQUIREMENTS





1. Front : 70 cm (27.6")
2. Back : 10 cm (3.9")
   : 15 cm (6.0) (when the sorter is installed.)
3. Right : 80 cm (31.5")
4. Left : 30 cm (11.8")

NOTE: Make sure there is at least 15 cm (6.0") clearance on the back side, in order to avoid damaging the sorter when it is opened.

1.4 POWER REQUIREMENTS

1. Input voltage level:

   110V/60Hz : More than 15A (for Taiwan)
   115V/60Hz : More than 15A (for N.A.)
   220V/50Hz : More than 8A (for EU.)
   220V/60Hz : More than 8A (for EU.)
   240V/50Hz : More than 8A (for EU.)

2. Permissible voltage fluctuation: ±10%

3. Do not set anything on the power cord.

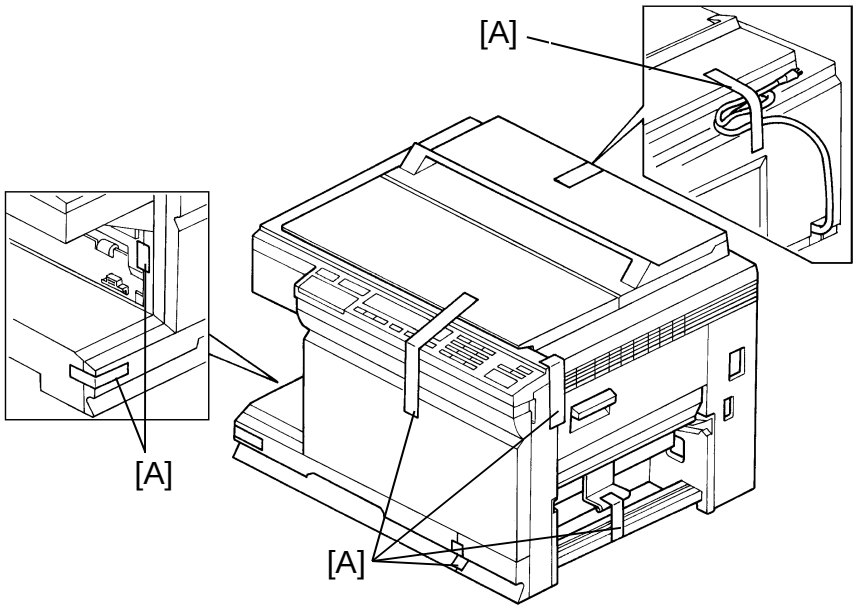
NOTE: a) Be sure to ground the machine. (Do not connect the grounding wire to a gas pipe.)

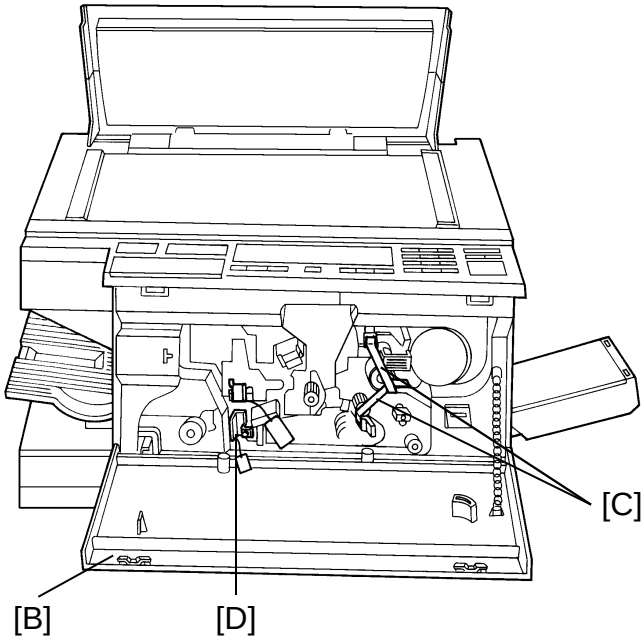
b) Make sure the plug is firmly inserted in the outlet.

c) Avoid multi-wiring.

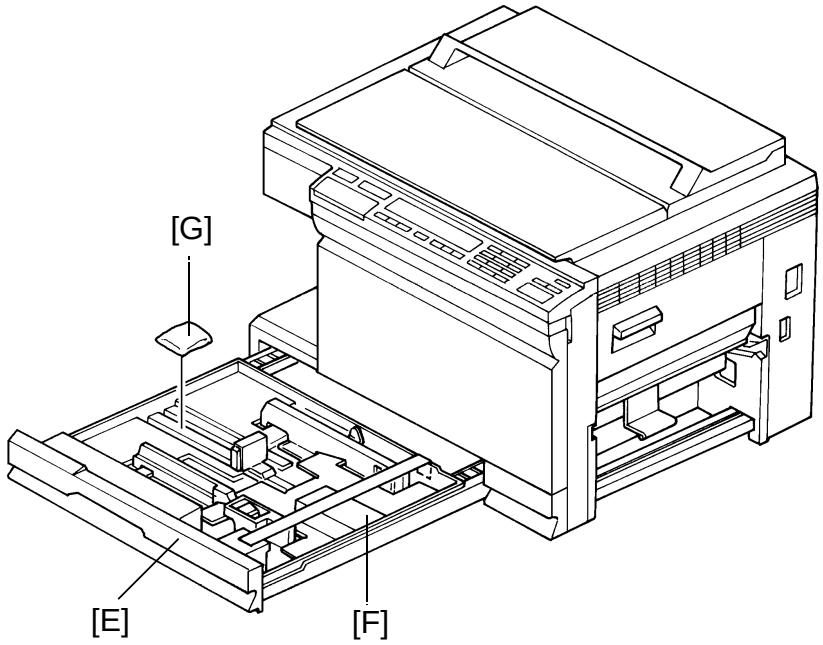
2. INSTALLATION PROCEDURE

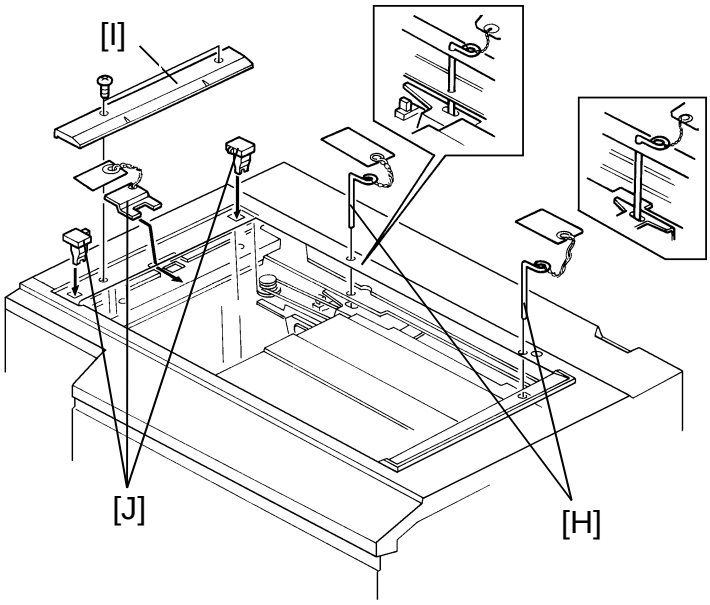
2.1 COPIER INSTALLATION





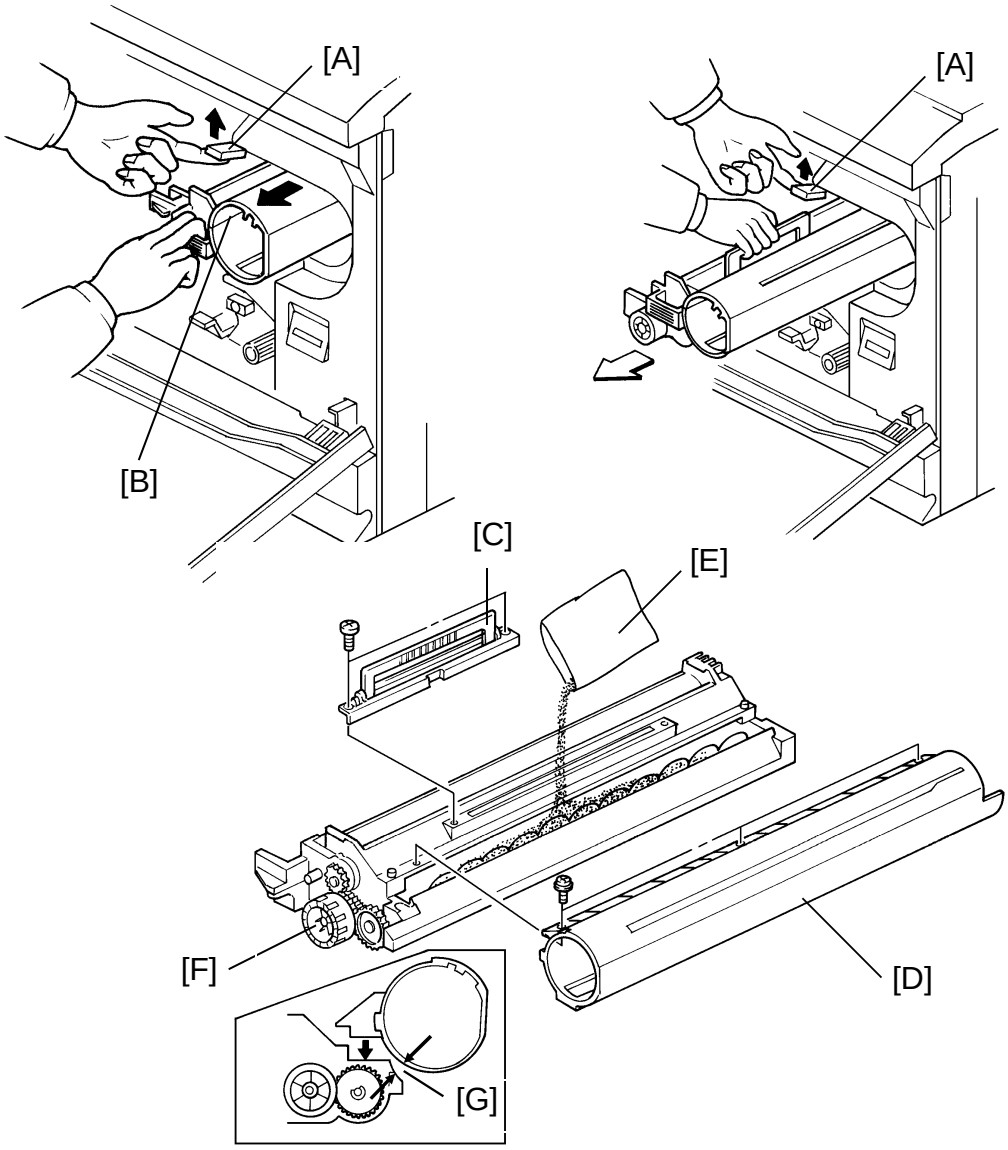
1. Remove the strips of tape [A] from the copier at the locations shown.
2. Open the front cover [B], and remove the strips of tape [C].
3. Remove the transport unit lock plate [D] (2 screws).





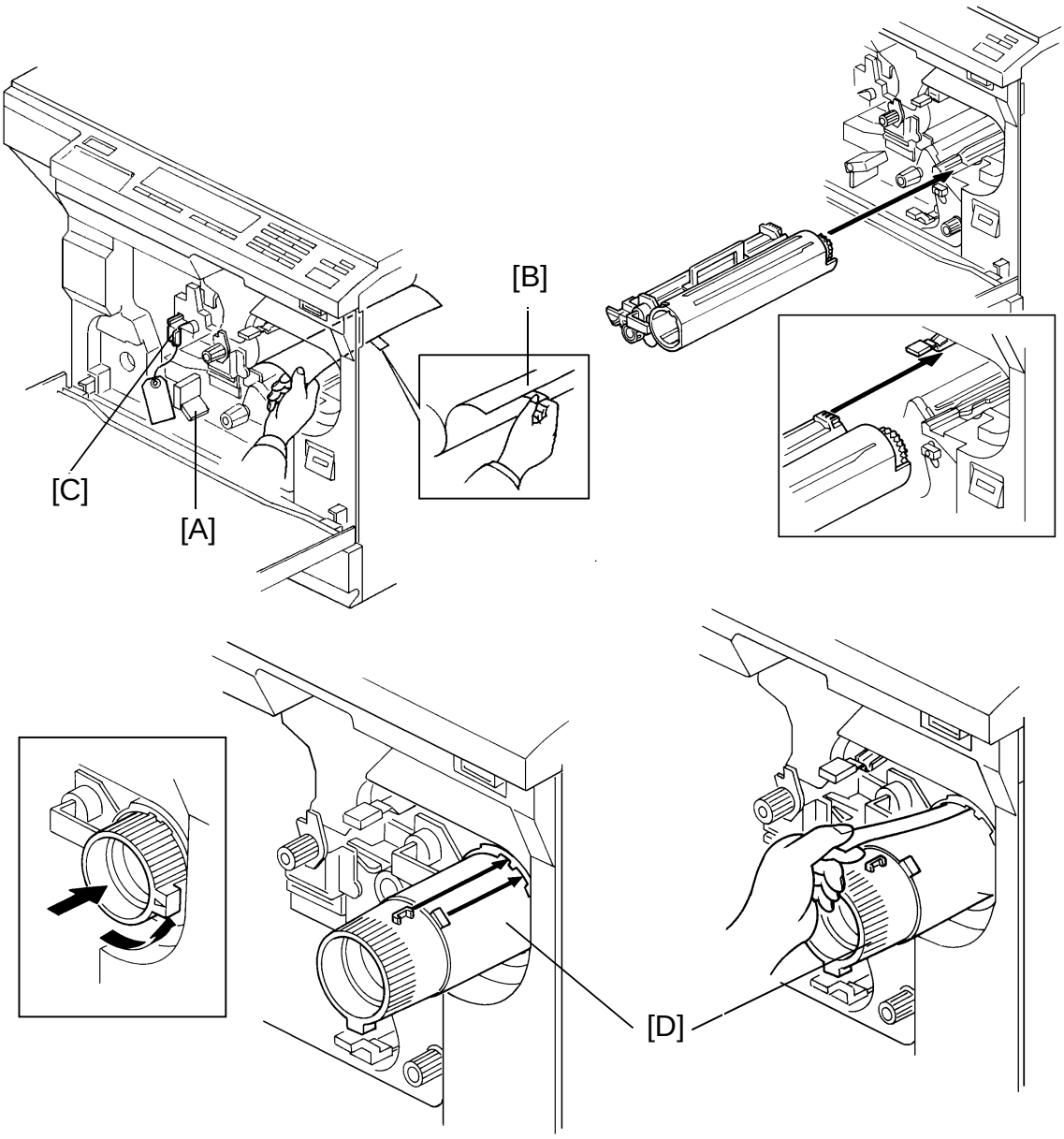
4. Pull out the paper tray [E] and remove the foam block [F], tape, and silica gel [G].
5. Open the platen cover and remove the optics lock pins [H].
6. Remove the left scale [I] (2 screws) and the scanner lock plates [J].

NOTE: Save the lock pins [H] and lock plates [D and J] for future use.



7. Raise the development unit lock lever [A], pull out the development unit [B], and place it on a clean sheet of paper.
8. Remove the filter bracket [C] (2 screws). (The development unit handle is attached.)
9. Remove the toner tank [D] from the development unit (3 screws).
10. Pour one pack of developer [E] into the development unit while turning the development roller knob [F] counterclockwise to distribute the developer.
11. Reinstall the toner tank and the filter bracket on the development unit.

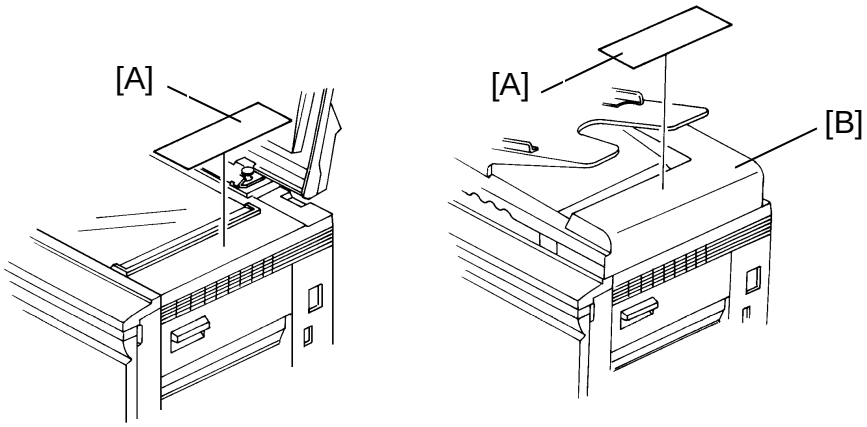
NOTE: Make sure that there is no gap [G] between the toner tank and the development unit.



12. Lower the transport unit lever [A].
13. Remove the drum protective sleeve [B].
14. Remove the lock plate [C] from the cleaning blade release lever.

NOTE: Save the lock plate for future use.

15. Reinstall the development unit as shown.
16. Shake the toner cartridge [D] well to distribute the toner evenly inside the cartridge. Then, install the cartridge as shown above.



17. Plug in the machine and turn on the main switch, then place a few sheets of white paper (A3 or 11"x17") on the exposure glass and lower the platen cover.

18. Perform 220/240 Conversion (240V machine only), Black Developer Initial Setting, and the Toner End Check.

    To access the SP modes, press the following keys in the order given.

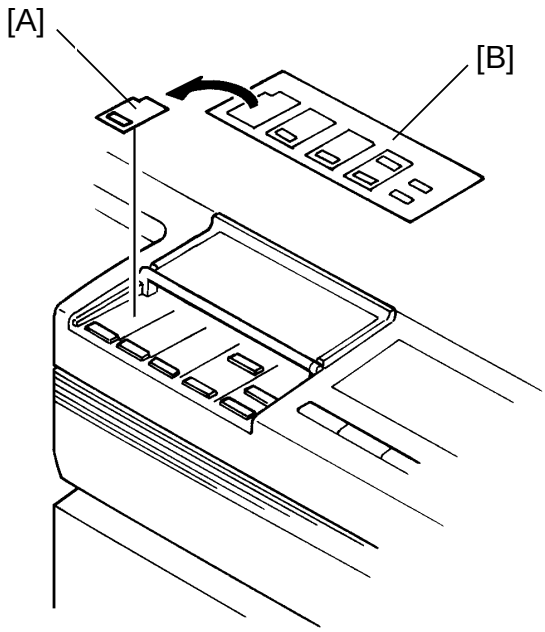
    (1) Clear Mode key
    (2) Clear/Stop key
    (3) Enter key

Access SP modes in the following sequence:

Step	SP MODE NUMBER		PROCEDURE
1	12	220/240 Conversion	This SP mode is only for 240 volt areas. Enter "12" using the numeral keys. Then, press the Enter key while holding down the Point key. Finally, change the data from "0" to "1".
2	65	Developer Initial Setting	Enter "65" using the numeral keys and press the Enter key. "20" will be displayed in the copy counter. Press the Start key for initial setting.
3	63	Toner Supply Unit Initial Setting	Enter "63" using the numeral keys and press the Enter key while holding down the Point key.

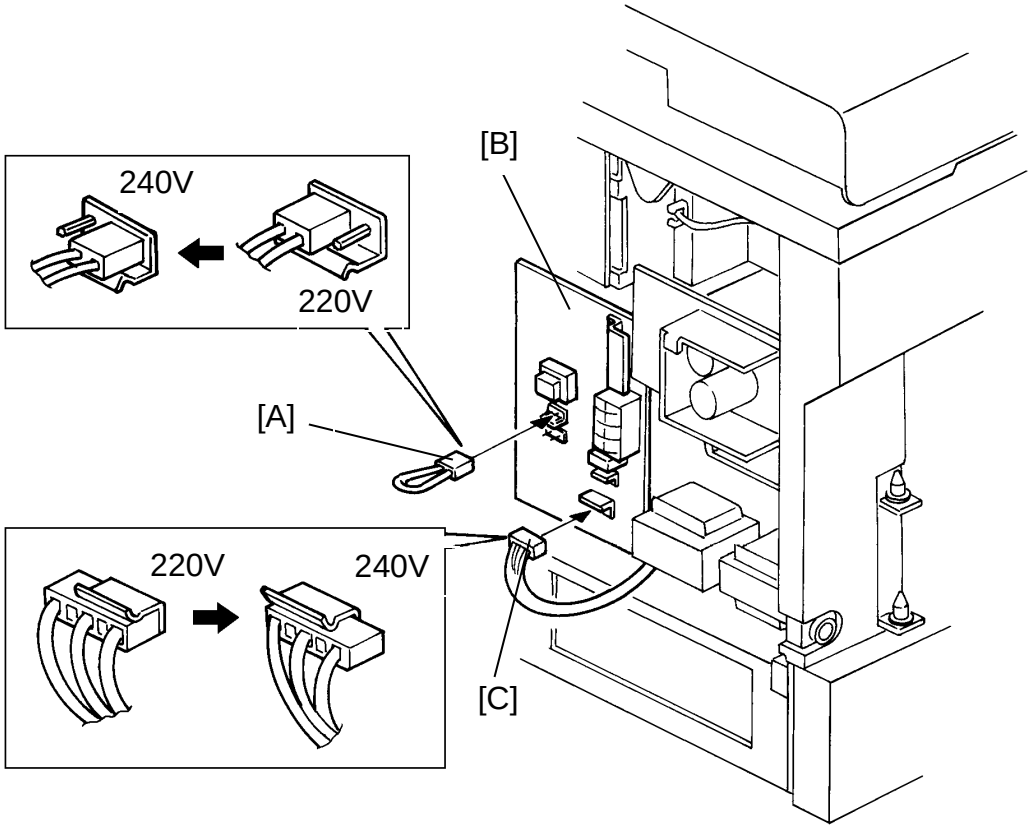
19. Place the outer decal (symbol explanation) [A] on the upper cover and install the receiving tray.

NOTE: If the DF is installed on the machine, place the outer decal [A] on the DF [B] as shown.



20. If an option (DF, Sorter, Duplex) is not installed on the machine, place a cover sheet [A] from sheet [B] over the operation panel as shown.
21. Load paper into the cassette and/or paper tray and check the machine operation and copy quality.

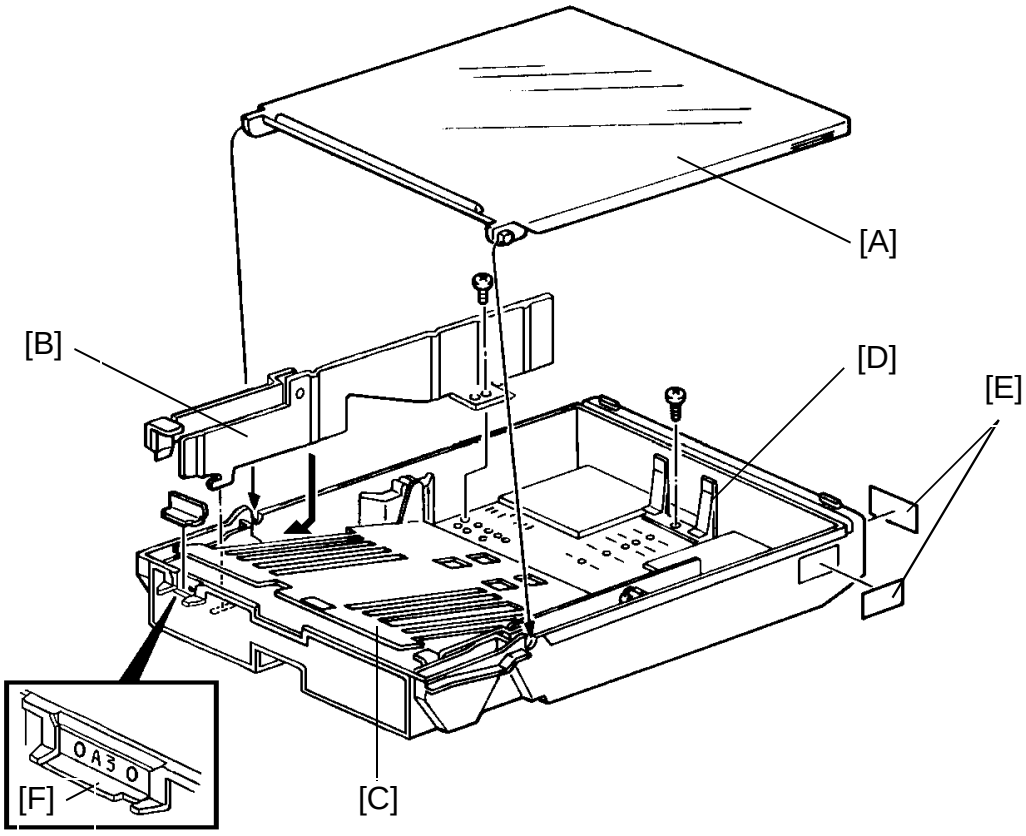
2.2 220/240V CONVERSION



NOTE: In areas where 240 volts is the standard, the connectors on the ac drive board must be repositioned as explained below. This procedure is also done after step 1 of the copier installation procedure.

1) Remove the rear cover (4 screws).
2) Disconnect the short connector [A] (2P/White) on the ac drive board [B] from CN421 and reconnect it to CN 421 as shown in the illustration.
3) Disconnect the transformer connector [C] (3P/White) on the ac drive board from CN417 and reconnect it to CN417 as shown in the illustration.
4) Reinstall the rear cover.
5) Change the data of SP mode #12 from "0" to "1". (Step 17 explains how to access the SP mode.)

2.3 CASSETTE MODIFICATION

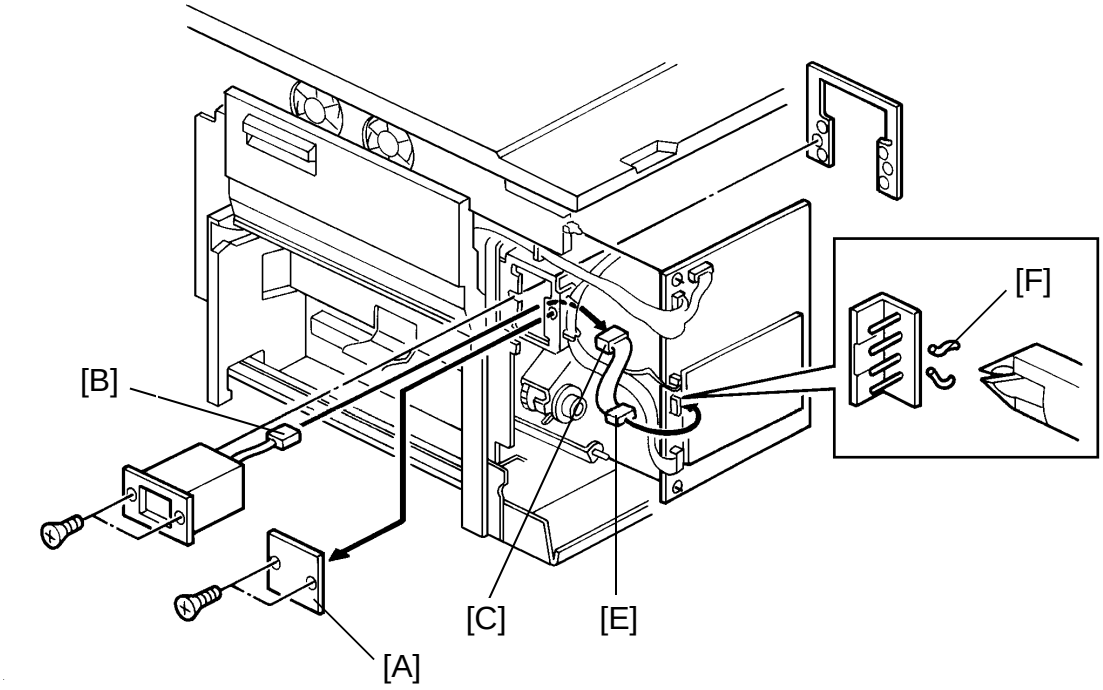


1. Take off the cassette cover [A].
2. Remove the side fences [B] (1 screw each) and the bottom plate [C].
3. Reposition the rear fence [D] in the desired paper size position (1 screw).

NOTE: Paper size positions are shown on the inside of the cassette.

4. Reinstall the bottom plate.
5. Reinstall the side fences in the desired size positions.
6. Attach the proper paper size decals [E] on the cassette at the positions shown.
7. Insert the actuator plate [F] in the slot on the front of the cassette as shown.

2.4 KEY COUNTER HOLDER INSTALLATION (OPTION)



1.Make sure that the main switch is turned off.

2. Open the front cover and the manual feed table.

3. Remove the right cover (4 screws).

4. Remove the key counter cover [A] (2 screws).

5. Connect the 4P connector [B] of the key counter holder to the key counter harness [C] through the key counter access hole.

6. Position the fixing plate [D] as shown in the illustration and insert the key counter holder.

7. Align the holes in the fixing plate with the mounting holes of the key counter holder and secure the key counter holder (2 screws).

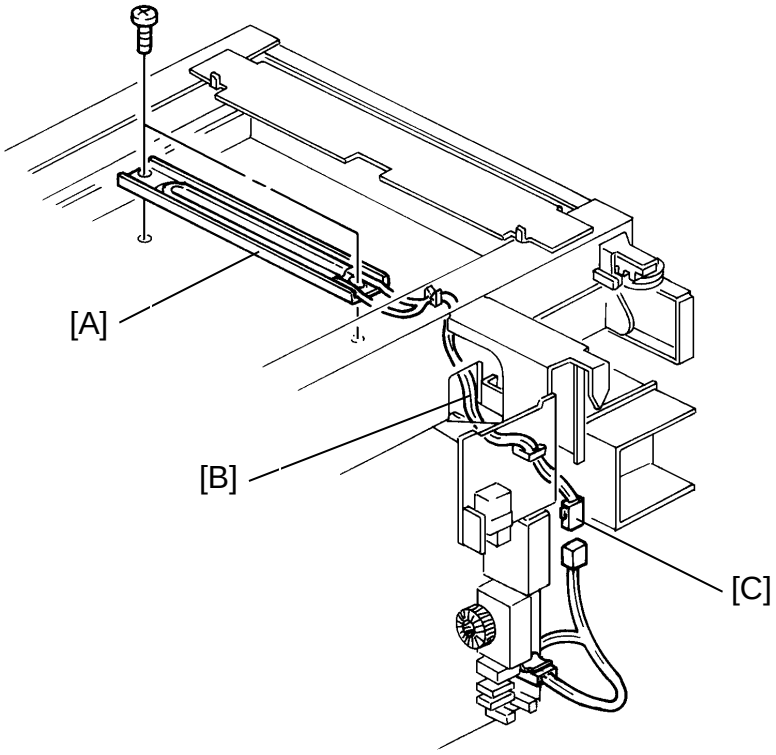
NOTE: The fixing plate has three different hole sizes. Use the holes that match those on the counter that you are installing.

8. Connect the other end of the key [E] counter harness to CN127 on the main board.

9. Cut off the jumper wire (JP103) [F] with a pair of pliers.

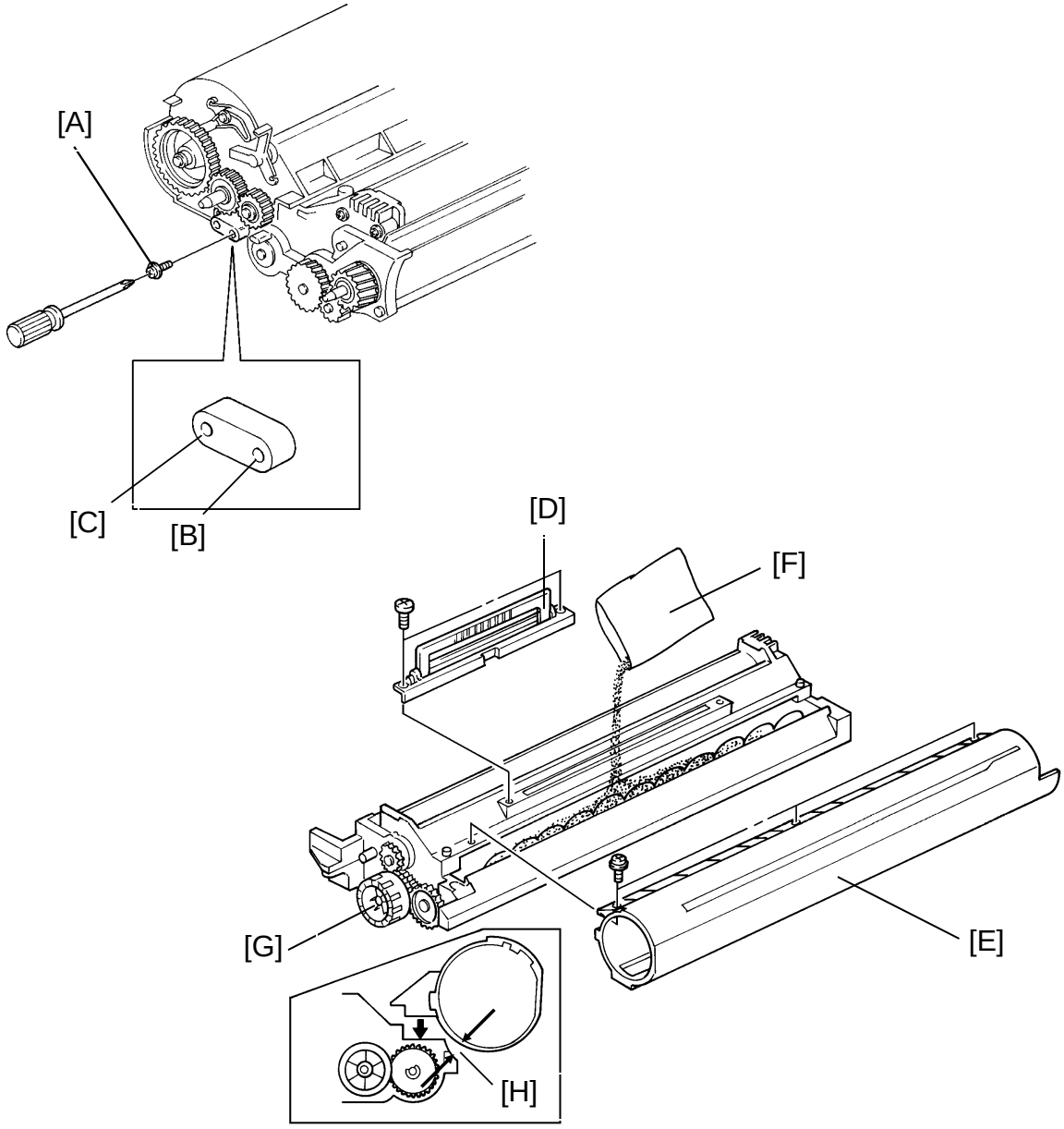
10. Reinstall all covers.

2.5 OPTICS ANTI-CONDENSATION HEATER INSTALLATION (OPTION)



1. Make sure that the main switch is turned off.
2. Remove the rear cover.
3. Remove the exposure glass. (See Exposure Glass Removal.)
4. Install the optics heater [A] in the optics cavity as shown (2 screws).
5. Wire the heater harness [B] and connect the connector [C] as shown.

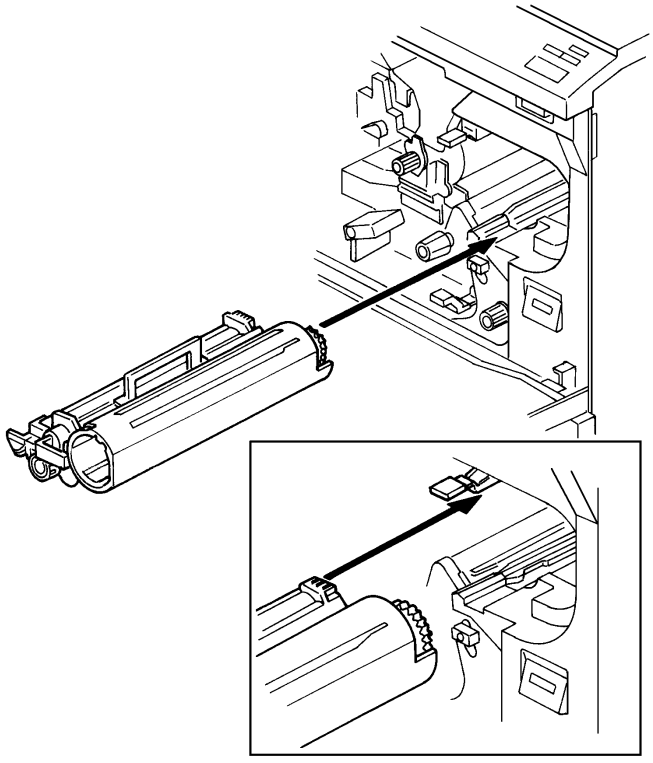
2.6 COLOR DEVELOPMENT UNIT INSTALLATION (OPTION)



NOTE: The two tapping screws (M4 x6) are enclosed as accessories.

1. Screw the tapping screws [A] into the holes at the rear side of the development unit as shown. Refer to the following table to determine the correct combination of screws for each color.

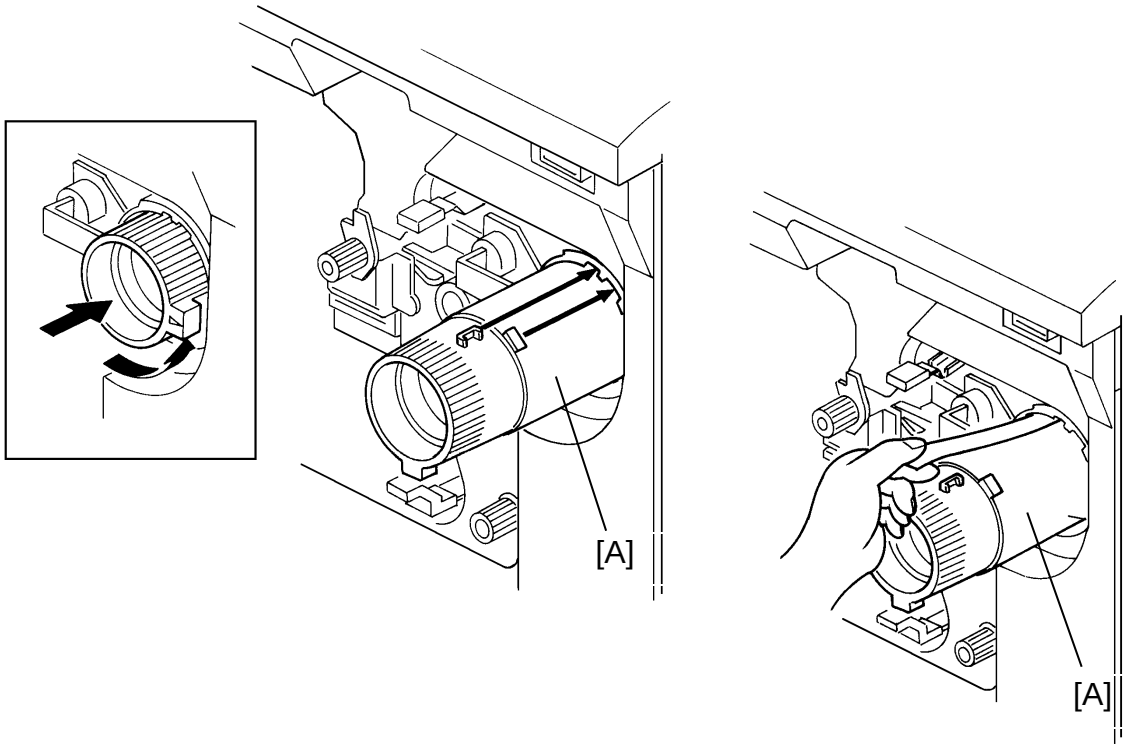
	Red	Green	Blue
Screw Hole [B]	Set	Not Set	Set
Screw Hole [C]	Not Set	Set	Set



2. Remove the filter bracket [D] (2 screws). (The development unit handle is attached.)
3. Remove the toner supply unit [E] from the development unit (3 screws).
4. Pour one pack of developer [F] into the development unit while turning the development roller knob [G] counterclockwise to distribute the developer.
5. Reinstall the toner supply unit and the filter bracket on the development unit.

NOTE: Make sure that there is no gap [H] between the toner supply unit and the development unit.

6. Install the development unit as shown.



7. Shake the toner cartridge [A] well to distribute the toner evenly inside the cartridge. Then, install the cartridge as shown.
8. Turn on the main switch and place a few sheets of white paper (A3 or 11" x 17") on the exposure glass. Then, lower the platen cover.
9. Perform Color Developer Initial Setting and Toner Supply Unit Initial Setting. To access the SP modes, press the following keys in order given.

   (1) Clear Mode key
   (2) Clear/Stop key
   (3) Enter key

   Access SP modes in the following sequence:

Step	SP MODE NUMBER		PROCEDURE
1	10	Color Developer Initial Setting	Enter "10" using the numeral keys and press the Enter key. "20" will be displayed in the copy counter. Press the Start key for initial setting.
2	63	Toner Supply Unit Initial Setting	Enter "63" using the numeral keys and press the Enter key while holding down the Point key.

10. Make a copy and check the copy quality.

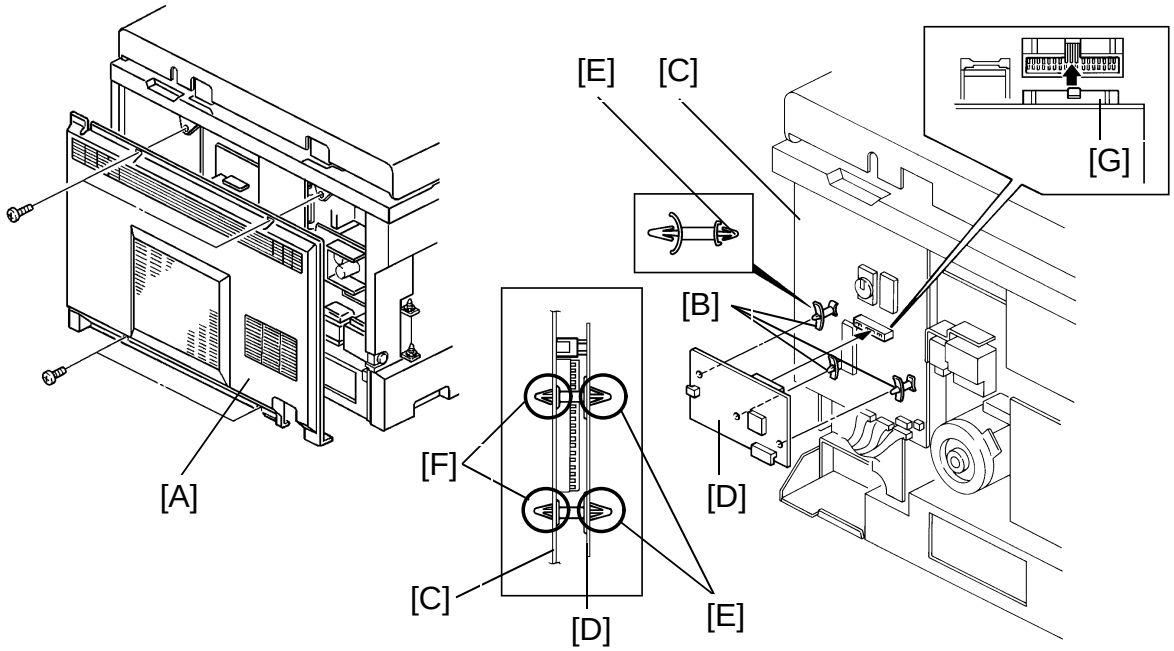
2.7 DC POWER SUPPLY UNIT INSTALLATION

Accessory Check

Check the quantity and condition of the accessories in the box according to the following list:

1. Interface Board 1
2. DC Power Supply Unit 1
3. Transformer 1
4. Locking Support - Short 1
5. Locking Support - Long 3
6. Locking Support Bracket 1
7. DC Power Supply Unit Bracket 1
8. Harness Support Bracket 1
9. DC Harness 1
10. Hexagon Head Tapping Screw - M3 x 6 6
11. Philips Pan Head Screw - M3 x 6 1

NOTE: Accessory Nos. 2 to 4 and 6 to 8 are not necessary to install the Sorter. However, all accessories should be installed for future use.



1. Make sure that the main switch is turned off and the power supply cord of the copier is unplugged.
2. Remove the rear cover [A] (4 screws).
3. Install the three locking supports (long) [B] on the main board [C] and install the interface board [D].

NOTE: 1. The smaller side [E] of the locking supports must be inserted through the main board as shown.

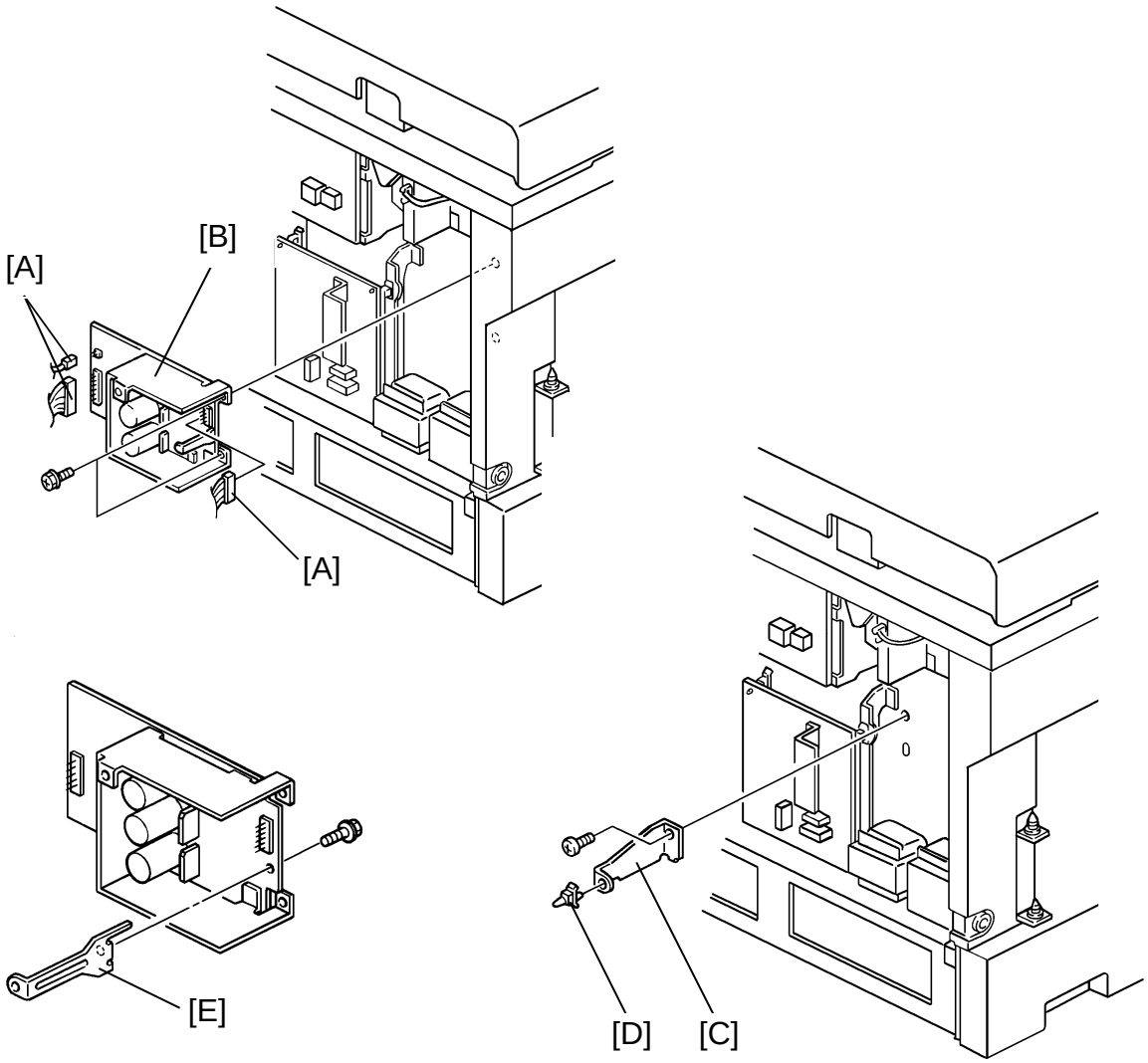
2. Be careful not to damage the main board when installing the locking supports and interface board.

3. After installing the interface board on the main board, confirm the following items to prevent erratic malfunction.

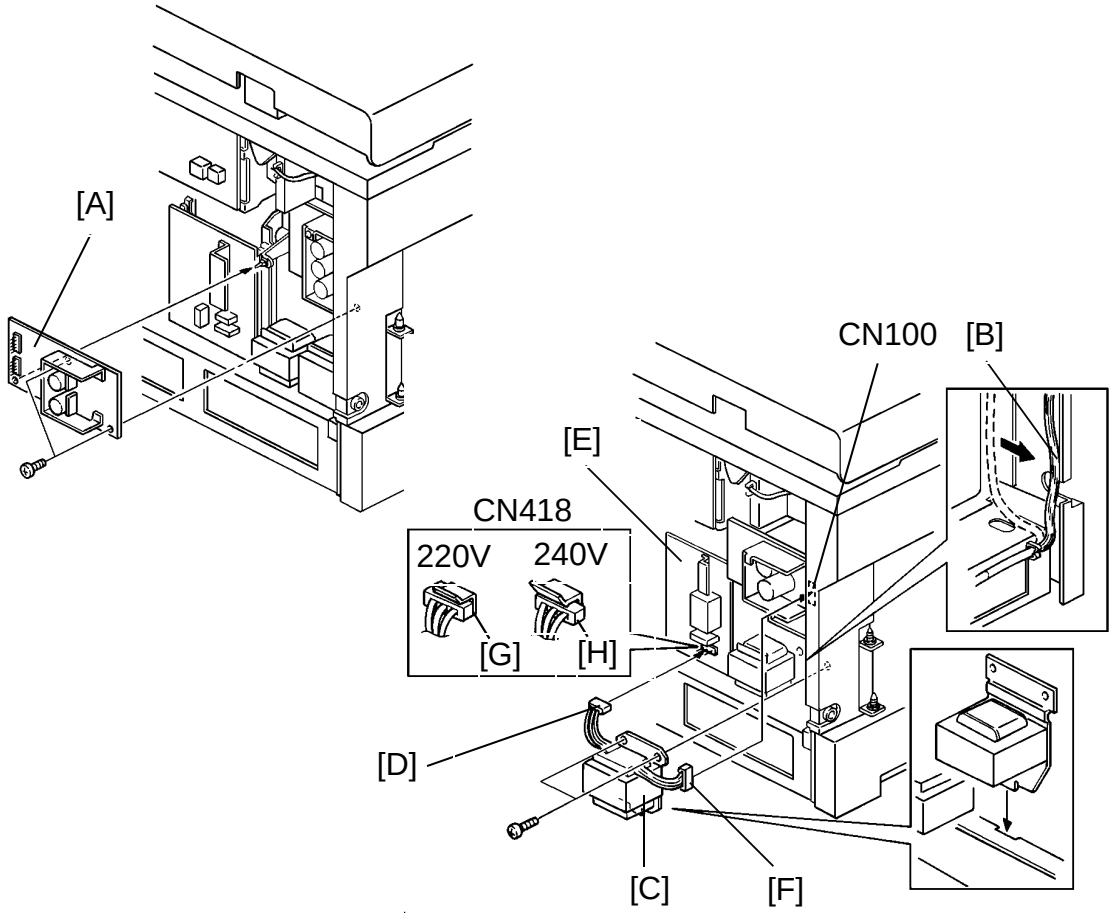
   a. The heads [F] of three locking supports must correctly lock the main board and interface board together as shown.

   b. The connector [G] of the interface board must be connected properly to the main board.

If erratic malfunction occurs, the memory of the RAM may be all set to zero. In this case, first you must clear all memory using SP Mode #99. Then, readjust the data of SP Modes #41, #42, #43, #44, #47, and #48.



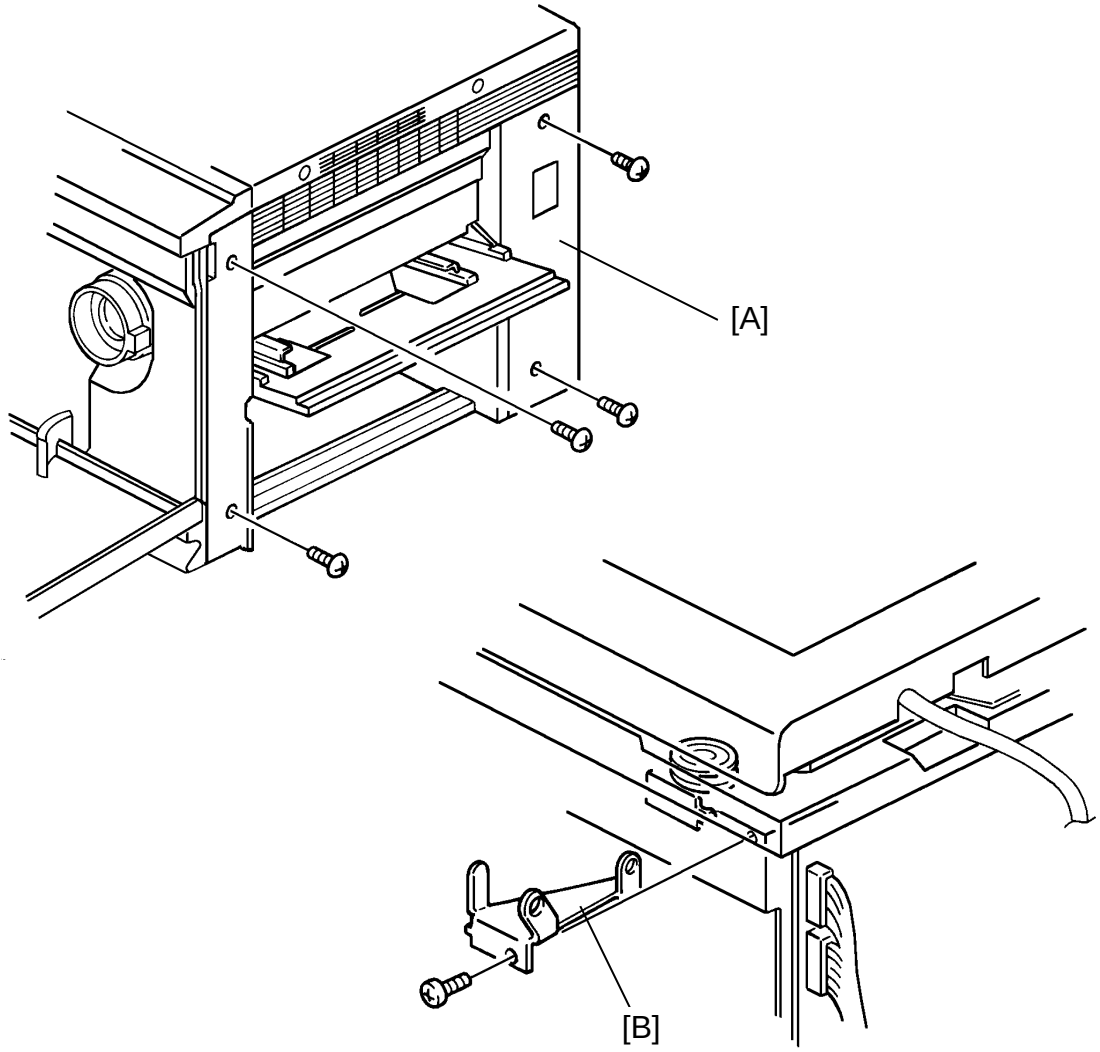
4. Disconnect the connectors [A] from the main dc power supply unit [B] on the copier.
5. Remove the main dc power supply unit (2 screws and 2 locking supports).
6. Install the locking support bracket [C] on the rear frame (1 screw) and install the locking support (short) [D] on it.
7. Install the dc power supply unit bracket [E] on the main dc power supply unit as shown.
8. Reinstall the main dc power supply unit.
9. Re-connect the connectors [A] on the main dc power supply unit.



10. Install the optional dc power supply unit [A] (2 screws and locking support) as shown.
11. To prevent damage to the ac harness [B] when installing the optional transformer [C], reposition the harness as shown.
12. Install the optional transformer [C] (2 screws).
13. Connect the connector [D] (3P/Black) of the transformer to CN418 on the ac drive board [E] and the connector [F] (4P/White) to CN 100 on the optional dc power supply unit.

NOTE: 1. The transformer connectors of the transformer are positioned differently for the 220V and 240V machines.
In the 220V machine, connect the connector [G] to CN418 as shown.
In the 240V machine, connect the connector [H] to CN418 as shown.

2. Connect the optional dc harness. (See the installation procedure for each option.)



14. Open the front cover and manual feed table; then, remove the right side cover [A] (4 screws).
15. Install the harness support bracket [B] (1 screw) as shown.

SECTION 4
SERVICE TABLES

1. SERVICE TABLES

1.1 TEST POINTS

Copier Main Board

NUMBER	FUNCTION
TP101	GND
TP102	VCC (+5V)
TP103	ADS (Auto Image Density Sensor) Adjust the voltage to 2.5 ± 0.1 using VR101.)
TP104	GND
TP105	AVSS (GND)
TP106	GND
TP107	HT (23°C 96kΩ)
TP108	BIN (Development Bias Feed Back)
TP109	GIN (Grid Voltage Feed Back)
TP110	PSE (ID sensor voltage) Adjust the voltage to 4.0 ± 0.2 using VR102.
TP111	EXPO (Exposure Lamp Voltage)
TP112	GND
JP103	Key Counter (Cut this jumper wire when installing the key counter on the machine.)

DF Main Board

NUMBER	FUNCTION
TP102	+5V
TP103	GND
TP104	Factory Use
TP105	+12V
TP106	+24V
TP107	Factory Use

1.2 DIP SWITCHES

Copier Main Board

DIP SWITCH	NORMAL	FUNCTION
* 101-1	OFF	Free run
** 101-2	OFF	Forced start (Ready temperature by-passed) **Factory Use**
101-3	OFF	Clear counter and/or memory
101-4	OFF	Service program mode access

* When this switch is set to ON, the SP mode is disabled.
Free run starts when the Start key is pressed. To stop the free run, press the C/S key.

** The copy quality cannot be guaranteed if the fusing unit has not yet reached standard operating temperature.
To cancel this mode, turn off DIP SW 101-2, then turn the main switch on and off.
This mode must not be used in the field. The fusing and pressure rollers may be damaged when toner remaining on the rollers melts.

DF Main Board

DIP SWITCH 101				FUNCTION
1	2	3	4	
ON	OFF	OFF	OFF	* Normal
ON	OFF	OFF	ON	1 sided free run
OFF	ON	OFF	ON	2 sided free run
OFF	OFF	ON	ON	Solenoid test: Switch101 - solenoids ON Switch102 - solenoids OFF
ON	ON	OFF	ON	Motor test (lift switch must be ON)
ON	ON	ON	ON	All indicators ON

* The factory setting of DIP switch 101 is as follows:

101-1	101-2	101-3	101-4
ON	ON	OFF	OFF

This is because the DF is used on several different models. When the DF is used with this copier, DIP switch 101-2 must be turned off to increase the data transmission speed.

Duplex Main Board

DIP SWITCH	FACTORY SETTING	FUNCTION
700-1		Jogger Position Adjustment (0.5mm per step) Refer to the Data Table on the next page.
700-2		
700-3		
700-4		
700-5	OFF	**Factory Use**
700-6	OFF	
700-7	OFF	
700-8	OFF	

Data Table (Jogger Position Adjustment)

DIP SWITCH 700 (0:OFF, 1:ON)				ADJUSTMENT VALUE
1	2	3	4	
0	0	0	0	-3.5mm
1	0	0	0	-3.0mm
0	1	0	0	-2.5mm
1	1	0	0	-2.0mm
0	0	1	0	-1.5mm
1	0	1	0	-1.0mm
0	1	1	0	-0.5mm
1	1	1	0	±0
0	0	0	1	0.5mm
1	0	0	1	1.0mm
0	1	0	1	1.5mm
1	1	0	1	2.0mm
0	0	1	1	2.5mm
1	0	1	1	3.0mm
0	1	1	1	3.5mm
1	1	1	1	4.0mm

1.3 VARIABLE RESISTORS

Copier Main Board

NUMBER	FUNCTION
VR101	Adjusts ADS Voltage (2.5 ± 0.1)
VR102	Adjusts ID Sensor Voltage (4.0 ± 0.2)

Power Pack (CC/Grid/Bias)

NUMBER	FUNCTION
VRC	Adjusts Main Charge Current
VRG	Adjusts Standard Grid Voltage
VRB	Adjusts Standard Dev. Bias (Factory Use)

Power Pack (T&S)

NUMBER	FUNCTION
VRT	Adjusts Transfer Current
VRD	Adjusts Separation Current

AC Drive Board

NUMBER	FUNCTION
VR401	Factory Use

DF Main Board

NUMBER	FUNCTION
VR101	Factory Use
VR102	Original leading edge registration adjustment (One sided original mode)
VR103	Original leading edge registration adjustment (Two sided original mode)
VR106	Factory Use

2. SERVICE PROGRAM MODE

2.1 SERVICE PROGRAM MODE OPERATION

The service program (SP) mode is used to check electrical data and change modes or adjustment values.

2.1.1 Service Program Access Procedure

There are two ways to access an SP mode.

(1) By key operation
(2) By turning on DIP switch 101-4 (on the main board)

All SP modes except for #27, #98, and #99 can be accessed by key operation. When accessing SP modes 27, 98, and 99, DIP switch 101-4 must be on. All SP modes can be accessed by turning on DIP switch 101-4.

Access Procedure 1 - Key Operation

1. Turn on the main switch.
2. Press the Clear Modes key
3. Press the Clear/Stop key.
4. Press the Enter key. "5" will blink in the copy counter and the ADS indicator or one of the Manual Image Density indicator LEDs will blink.
5. Enter the desired SP mode number using the numeral keys. The SP mode numbers are given in the Service Program table. The SP mode number can also be selected with the zoom key (+, –).

NOTE: To cancel an SP mode number after entering it, press the Clear/Stop key.

6. Press the Enter key while holding down the Point (".") key.

NOTE: a) If an invalid SP mode number is entered and the Enter key is pressed while pressing the Point key, the display on theoperation panel does not change.

b) With the following SP modes, press only the Enter key.
SP Mode numbers: #10, #11, #15, #17, #21, #34, #65, #66

7. To leave SP mode, press the Clear Modes key.

Access Procedure 2 - DIP switch 101-4

1. Turn the main switch off.
2. Remove the rear cover and turn on DIP SW 101-4, then turn on the main switch. "5" will blink in the copy counter and the ADS indicator or a Manual Image Density indicator LED will blink.
3. Using the numeric key board, enter the desired SP mode number. (SP mode numbers are given in the Service Program Mode table.) The SP program can also be selected with the zoom keys (+, –).

NOTE: To cancel an already entered program, press the Clear key.

4. Press the Enter key to view data.

NOTE: If an invalid SP number has been entered and the Enter key (#) is pressed, the display on theoperation panel does not change.

5. To leave SP mode, turn the main switch OFF, turn off DIP SW101-4, and turn the main switch on.

2.1.2 Change Adjustment Values or Modes

1. Follow steps 1-5 in access procedure 1 and steps 1-3 in access procedure 2.
2. The factory-set value or mode will be displayed in the Magnification indicator.
3. Enter the desired value or mode using the numeral keys. (SP mode numbers are given in the Service Program Mode table.)
4. To leave SP mode, press the Clear Modes key (access procedure 1) or turn off the main switch and DIP SW101-4 (access procedure 2).

2.1.3 Memory Clear Procedure

<SP-98 "Clears all counters">

Service Program SP-98 is used to clear all counters (copy counters, PM counter, self-diagnostic counters, misfeed counters). The procedure is as follows:

1. Turn off the main switch.
2. Turn on DIP SW101-3 & 4 on the main board and turn on the main switch.
3. Select Service program SP-98 and press the "1" key on the key pad, then press the Enter key.

   At this point all counters will be cleared to "0".
4. Turn off the main switch.
5. Turn off DIP SW101-3 and 4.
6. Turn on the main switch to resume normal copier operation.

NOTE: When the counters are cleared, the Magnification indicator will blink 4 times.

<SP-99 "Clear all memory">

This Service Program clears all counters as well as all adjustments and modes. All modes return to factory settings, and all adjustments returns to factory settings or defaults.

1. Turn off the main switch.
2. Turn on DIP SW 101-3 and 4 on the main board.
3. Turn on the main switch.
4. Select SP-99 and press the "1" key on the key pad, then press the Enter key to clear the memory.

NOTE: When the memory is cleared, the Magnification indicator will blink 5 times.

5. Turn off both the main switch and DIP SW101-3 and 4, then turn on the main switch to resume copier operation.

2.1.4 Others

In the following 13 SP modes, copies can be made by pressing the Start key:

SP Modes #5, #6, #8, #37, #41, #42, #43, #44, #47, #48, #52, #55, and #59

2.2 SERVICE PROGRAM MODE TABLE

* Copies can be made. (**Refer to NOTE 1.**)

Mode No.	Function	Data	Factory Setting	Comments
*5: Exposure Lamp OFF	Exposure lamp OFF Turn on DIP switch 101-1, then press the Start key to start free run. Press the C/S key to stop free run. Press the Enter key in Ready mode to turn off this mode.			Use this mode for the scanner movement check. To conserve toner, remove the development unit and disconnect CN123 on the main board before turning on the main switch.
*6: Jam Detection Off	Copies are made without jam detection. Press the Start key to make a copy. Press the Enter key in Ready mode to turn off this mode.			Use this mode to check whether the paper jam was caused by a jam sensor malfunction. The copy counter increments when copies are made in this mode.
8: Input Check	Displays the input from sensors and switches.	See comments		For data, see page 4-22.
9: Output Check	Electrical components turns on.	See comments		For data, see page 4-23.
10: Color Developer Initial Setting	Used to set the new color developer condition.			**Initial setting is required when new developer is installed.** After color developer conditioning (20 cycles) is completed, the copier automatically returns to normal mode.
*11: All Indicators ON	Turns on all the indicators on the operation panel			To turn off the indicators, press the Enter key.

Mode No.	Function	Data	Factory Setting	Comments
12: 220V/240V Conversion	Selects 220 or 240 volts.	0: 220V 1: 240V	0	If the rated voltage is 240V, this data must be changed to "1". **Refer to NOTE 2.**
15: Auto Reset Time	Selects auto reset of 1 or 3 minutes, or cancels this mode.	0: 1 min. 1: 3 min. 2: None		
16: Count Up/Down	Selects count up or count down.	0: Up 1: Down	0	
17: Auto Feed Station Shift	Selects auto feed station shift mode.	0: Auto Shift 1: Manual	0	Copier automatically shifts to the cassette or paper tray holding same size paper when paper runs out.
19: ADS Priority	Specifies whether the copier defaults to ADS or manual mode when the main switch is turned on.	0: ADS 1: Manual	0	
20: APS Priority (Copier)	Specifies whether the copier defaults to APS or manual mode when the main switch is turned on.	0: APS 1: Manual	0	This mode is used only on the A054 copier.
21: APS Priority (ADF)	Specifies whether the copier defaults to APS or manual mode when the original is set on the DF.	0: APS 1: Manual	1	DF must be installed on the machine.
22: SADF Shut-off Time	Selects shut-off time for SADF mode.	0: 5 sec. 1: 60 sec.	0	
23: ADF Free Size	Enables originals of various sizes to be fed from the same size stack.	0: No 1: Yes	0	
24: Factory Use				

Mode No.	Function	Data	Factory Setting	Comments
25: Margin Adjustment in Duplex Mode	Sets the margin (5 mm) on the right side of the reverse page.	0: Yes 1: No	0	Duplex must be installed on the machine. When 1 sided original mode is selected, the back margin (5 mm) is automatically added on the right side of the reverse page.
27: A3 (DLT) Double Counter	Selects single or double counter of the total counter in A3/DLT copies.	0: Normal 1: Double	0	
28: Sort Priority	Sort Mode is automatically selected when more than1 original is set on the DF table and the entered copy quantity is greater than 1 and less than 21.	0: Manual 1: Auto Sort	0	Sorter and DF must be installed on the machine. When in duplex mode, more than 2 originals must be set.
29: Fusing Temperature Control	Selects fusing temperature control mode.	0: ON/OFF control 1: Phase control	0	After selecting the control mode and turning the main switch off/on, the fusing temperature control is changed.
30: Black Toner Supply Mode	Selects black toner supply system.	0: Detect Mode 1: Fixed Mode	0	See SP 31/SP32 for toner supply amount.
31: Black Toner Supply Ratio (Detect Mode)	Determines how much toner is supplied in detect mode.	0: 15% 1: 7% 2: 30% 3: 60%	0	
32: Black Toner Supply Ratio (Fixed Mode)	Determines how much toner is supplied in fixed mode.	0: 7.0% 1: 3.5% 2: 10.5% 3: 14.0%	0	
33: ID Sensor Bias (Black)	Sets the bias voltage applied to the development roller for the image density check.	0: -260V 1: -220V 2: -280V 3: -300V	0	-260V = normal -220V = lighter -280V = darker -300V = darkest

Mode No.	Function	Data	Factory Setting	Comments
34: ADS Level	Selects the image density level in ADS mode.	0: Normal 1: Darker 2: Lighter	0	Data #1: Increases bias output (+40V). Lamp voltage is standard value. Data #2: Increases exposure lamp data (+4). Bias voltage is standard value.
35: Black Toner ID Detection	ID sensor check is performed every 5 copies or 10 copies.	0: 10 copies 1: 5 copies	0	If low image density occurs in the near end condition, change the data to "1".
*37: Black Bias Adjustment	Adjusts black bias output if the image density at level 4 cannot be adjusted in Light Intensity mode (SP 48).	0: V_0 1: V_0+40V 2: V_0+20V 3: V_0 - 20V 4: V_0 - 40V	0	V_0 = Standard Bias 0: Normal 1: Darkest 2: Darker 3: Lighter 4: Lightest
*41: Lead Edge Erase Margin Adjustment	Adjusts the lead edge erase margin.	0 – 15	0 –15 Default = 8	0.5 mm per step. (max. - 4.0 mm to +3.5mm)
*42: Registration Adjustment	Adjusts registration.	0 – 15	0 –15 Default = 8	0.5 mm per step. (max. -4.0 mm to +3.5mm)
*43:Vertical Magnification Adjustment	Adjusts magnification in the paper travel direction.	0 – 15	0 –15 Default = 8	0.2% per step. (max. -1.6% to +1.4%)
*44: Horizontal Magnification Adjustment	Adjusts magnification perpendicular to the direction of paper travel.	0 – 15	0 –15 Default = 8	0.2% per step. (max. -1.6% to +1.4%)
*47: Focus Adjustment	Adjusts the 4th/5th mirror position to correct focus.	0 – 15	0 –15 Default = 8	This mode must be done after vertical and horizontal magnification adjustment (SP Mode #43 and 44).

Mode No.	Function	Data	Factory Setting	Comments
*48: Light Intensity Adjustment	Adjusts the exposure lamp voltage.	100 – 150	100 –150 Default = 126	The exposure lamp voltage is adjusted on the production line. (The factory setting is different for each machine. When clearing all memory, the data of this mode returns to "126".
49: Fusing Temperature Adjustment	Adjusts fusing temperature.	175 – 190°C	185°C	175 to 190°C in 1°C steps. If a number over 190 is input, the CPU sets the temp. at 190°. If under 175, 175° is set.
51: Exposure Lamp Voltage Display	Displays the exposure lamp voltage with a reference number.			The exposure lamp, main motor, and optics cooling fans turn on for 10 seconds when the Enter key is pressed. Press the C/S key to turn this mode off. Do not repeat more than 5 times to avoid overheating the optics cavity.
*52: Fusing Temperature Display	Displays the fusing temperature.			
54: Vsg Adjustment	Adjusts Vsg.			Adjust Vsg to 4.0 ± 0.2 using VR102 on the main board. The main motor and the ID sensor LED turn on when the Enter key is pressed. The Vsg voltage is displayed on the magnification indicator.

Mode No.	Function	Data	Factory Setting	Comments
*55: Vsg & Vsp Check	Display the Vsg and Vsp readings. The Vsg reading is displayed while the "0" key is held down. To stop this mode, press the C/S key.			The Vsp and Vsg voltage readings are updated every 10 or 5 copies (ID sensor timing).
56: ADS Voltage Adjustment	Adjusts ADS.			After adjusting the light intensity, place 6 or more sheets of A3 (LDG) white paper on the exposure glass and select this mode. Adjust ADS voltage to 2.5 ± 0.1 using VR101 on the main board.
*59: Bias Voltage Check	Displays bias voltage. Press the Start key to display the bias voltage. Press the C/S key to stop.			
61: Drum Wear Compensation Setting	Selects the drum wear compensation value.	0: 1/10h 1: 1/20h	0	3
62: ID Sensor Grid Voltage Setting	**Factory Use (The data must be "7".)**			
63: Toner Supply Unit Initial Setting	Used to supply toner from the toner cartridge to the toner hopper.			Initial setting must be done when the machine is installed and when the toner supply unit is replaced.
64: Black Toner Density Level Display	Displays the black toner density level detected by initial setting (SP #65)	0 1 2 3 4		Data Vsp/Vsg(%) 0 12 – 15 1 0 – 7 2 8 – 11 3 16 – 21 4 22 –

Mode No.	Function	Data	Factory Setting	Comments
65: Black Developer Initial Setting	Sets the data value corresponding to the Vsp/Vsg ratio for new black developer. "20" is displayed on the copy counter when the Enter key is held down. Press the Start key to start the initial setting. Vsg is displayed when the "0" key is held down.			**Initial setting must be done when new developer is installed.** The CPU monitors Vsg and Vsp for copies 11 to 18 of the free run. Vsp is displayed on the magnification indicator. The copier automatically returns to normal mode after initial setting is completed.
66: Drum Initial Setting	Used to set new drum condition.			**Initial setting must be done when a new drum is installed.** The OPC counter is cleared.
67: Vr Correction Ratio	Displays L values (Vr correction ratio).			L = Vrp/Vsg x 100
68: Vr Forced Detection	Detects Vrp and perform Vr correction.			1. Turn off the DIP SW 101-4 if it is on. 2. Make 5 copies.
69: OPC Counter	Shows the total number of copies made with the drum installed on the machine.			The first three digits are displayed in the magnification indicator when the Enter key is pressed. Press the "." key to display the second three digits.
70: Color Toner Supply Ratio (Fixed Mode)	Selects the color toner supply ratio.	0: 14% 1: 7% 2: 21% 3: 28%	0	This mode is available only when the color unit is installed.
71: Sorter Operation	Enables sorter operation.	0: No 1: Sorter (1) 2: Sorter (2)	0	**NOTE 3**

<table>
<tr><th>Mode No.</th><th>Function</th><th>Data</th><th>Factory Setting</th><th>Comments</th></tr>
<tr><td>73: Color Copy Counter</td><td>The Magnification indicator displays the total number of color copies (Red + Green + Blue).</td><td></td><td></td><td>The first three digits are displayed in the magnification indicator when the Enter key is pressed.
Press the "." key to display the second three digits.</td></tr>
<tr><td>74: Color Toner ID Detection</td><td>ID sensor check is performed every 5 copies or 10 copies.</td><td>0: 5 copies
1: 10 copies</td><td>0</td><td>Normally, "0" should be selected for color toner.</td></tr>
<tr><td>75: ID Sensor Bias (Color Toner)</td><td colspan="4">Selects the bias voltage applied to the bias roller when sensing image density.
<table><tr><th>Data</th><th>Red</th><th>Blue</th><th>Green</th></tr><tr><td>0
1
2
3</td><td>–240 V
–200 V
–260 V
–280 V</td><td>–300 V
–260 V
–320 V
–340 V</td><td>–320 V
–280 V
–340 V
–360 V</td></tr></table>0: Normal 1: Lighter
2: Darker 3: Darkest</td></tr>
<tr><td>76: Sorter Bin Capacity</td><td>Sets the stack quantity limit.</td><td>0: No Limit
1: Limit</td><td>1</td><td></td></tr>
<tr><td>77: ADF Odd Number Originals (Duplex Mode)</td><td>Sets the copier to eject the final copy if an odd number of originals are set.</td><td>0: On
1: Off</td><td>0</td><td>When on, the final sheet is fed out; when off, the sheet stays in the duplex tray.</td></tr>
<tr><td>*79: Color Bias Adjustment</td><td>Adjusts color bias output if the image density at level 4 cannot be adjusted in Light Intensity mode (SP 48).</td><td>0: V_0
1: V_0+40V
2: V_0+20V
3: V_0 – 20V
4: V_0 – 40V</td><td></td><td>V_0 = Standard Bias
0: Normal
1: Darkest
2: Darker
3: Lighter
4: Lightest</td></tr>
<tr><td>80: Red Toner Density Level Display</td><td>Displays the red toner density level detected by initial setting (SP #10).</td><td></td><td></td><td>Toner Density Level = Vsp/Vsg x 100</td></tr>
<tr><td>81: Green Toner Density Level Display</td><td>Displays the green toner density level detected by initial setting (SP #10).</td><td></td><td></td><td>Toner Density Level = Vsp/Vsg x 100</td></tr>
</table>

Mode No.	Function	Data	Factory Setting	Comments
82: Blue Toner Density Level Display	Displays the blue toner density level detected by initial setting (SP #10).			Toner Density Level = Vsp/Vsg x 100
87: PM Interval Setting	Sets the interval of the PM counter.	0: No PM 1: 40K 2: 60K 3: 80K 4: 100K	0	
88: PM Counter Display	The first three digits are displayed in the magnification indicator when the Enter key is pressed. Press the "." key to display the second three digits.			Displays contents of the PM counter. When the PM counter is exceeded, the Magnification indicator blinks.
89: PM Counter Reset	Resets the PM counter.	1 (**NOTE 4**)		Use this mode after performing PM.
93: Maximum Copy Quantity	Limits the maximum copy quantity that can be entered.	1 – 99	99	
98: Clear Counters	Clear the following counters: • Copy Counters • SC Counters • Jam Counters • PM Counter	0: No 1: Yes		DIP switches 101-3 and 4 on the main board must be on.
99: Clear All Memory	Clear all counters and returns all modes to the factory setting.	0: No 1: Yes		DIP switches 101-3 and 4 on the main board must be on.

Mode No.	Function	Data	Factory Setting	Comments
100:First Station Copies	Displays the total number of copies fed from the first feed station (cassette and manual feed table).		0	The first three digits are displayed in the magnification indicator when the Enter key is pressed. Press the "." key to display the second three digits. SP mode #102 is used only on the A054 copier. SP mode #103 and #104 are not used.
101: Upper Paper Tray Copies	Displays the total number of copies fed from the upper paper tray.		0	
102: Lower Paper Tray Copies	Displays the total number of copies fed from the lower paper tray.		0	

Mode No.	Function	Data	Factory Setting	Comments
105:Duplex Copies	Displays the total number of copies made in duplex mode.		0	The first three digits are displayed in the magnification indicator when the Enter key is pressed. Press the "." key to display the second three digits.
106:DF Originals	Displays the total number of originals fed from the DF.		0	
120:Service Calls (total)	Displays the total number of times the service call indicator has turned on.		0	
121:Optics Section Service Calls	Displays the total number of service calls involving the optics section.		0	
122:Exposure Lamp Service Calls	Displays the total number of service calls involving the exposure lamp.		0	
123:	Not used			
124:Fusing Section Service Calls (E53 and 54)	Displays the total number of service calls involving the fusing unit.		0	
125:Service Calls for Interface Comunication	Displays the total number of "Interface Communication" service calls between the copier and duplex tray.		0	
130:Misfeeds(total)	Displays the total number of paper misfeeds.		0	

Mode No.	Function	Data	Factory Setting	Comments
131:Number of Misfeeds by Location	Display the total number of paper misfeeds for each area.		0	"1" will be indicated in the copy counter when the Enter key is pressed. Press the Zoom keys ("+" or "–") to select the following numbers: 1: Paper Feed 2: Exit 3: Sorter 4: DF 5: Duplex

NOTE 1: After an SP mode is selected, the copier goes automatically into copy mode when data is changed (SP modes 37, 41-44, 47-48) or when the Enter key is pressed (SP modes 5, 6, 11, 52, 59, 79). To make a copy after changing data in SP mode, press the Start key. If you do not wish to make a copy after changing data, press the Enter key. "5" will blink in the copy counter and you can select another SP mode.

NOTE 2: Connectors CN418 and CN421 must be repositioned and the data in SP Mode #12 must be changed when the copier is installed in a 240V area.

NOTE 3: The following functions can be selected in SP Mode #71:

Data	Function
0	1. Sort/stack mode can only be selected when the sorter is closed. 2. In Sort/stack mode, user code #4 is displayed when the sorter is opened.
1	User code #4 is displayed whenever the sorter is opened.
2	1. In Sort/stack mode, user code #4 is displayed when the sorter is opened. 2. Sort/stack mode can be selected even if the sorter is open. User code #4 is displayed when Sort/stack mode is selected.

NOTE 4: How to clear the PM counter

1) Enter "89", then press the Enter key.
2) Enter "1" to clear the PM counter, then press the Enter key.

2.3 SP-8 SENSOR/SWITCH DATA CHECK

- How to check sensor/switch data -

1. Press "8", then press the Enter (#) key while pressing the Point key.
2. With the numeral keys, enter the desired input number. The input numbers are given in the following table.
3. Press the Enter (#) key again.
4. Enter the number of copies and press the Start key.
5. The data (0 or 1) will be displayed in the magnification indicator.

NOTE: The ON/OFF status can also be checked manually.

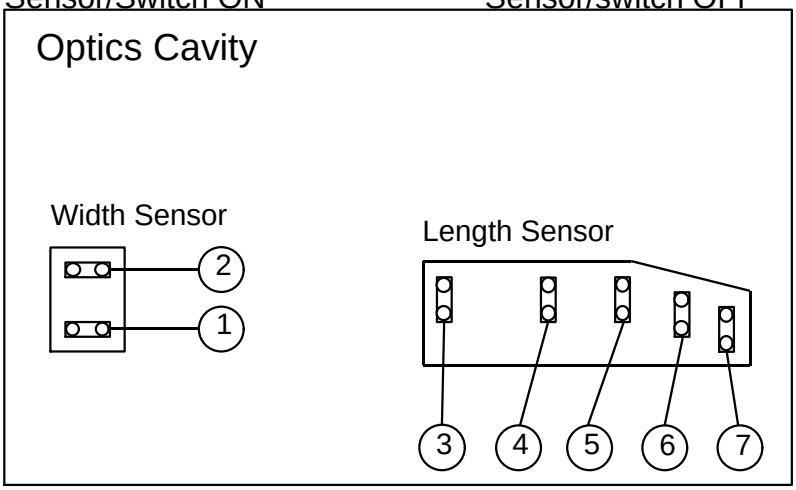
Input No.	Sensor/Switch/Signal	Data	
		0	1
1	Registration Sensor	Paper not detected (HIGH)	Paper detected (LOW)
2	Exit Sensor		
3	Cassette Lift Sensor	Casssette lift arm down (HIGH)	Cassette lift arm up (LOW)
4	1st Paper End Sensor	Paper end detected (HIGH)	Paper detected (LOW)
5	2nd Paper End Sensor		
6	3rd paper End Sensor (**used only on the A054 copier**)		
9	Manual Feed Table Switch	Table closed (HIGH)	Table open (LOW)
10	Right Cover Switch (**used only on the A048 copier**)	Cover closed (HIGH)	Cover open (LOW)
11	Right Cover Switch (**used only on the A054 copier**)		
14	Relay Sensor (**used only on the A054 copier**)	Paper not detected (HIGH)	Paper detected (LOW)
17	Scanner HP Sensor	OFF (LOW)	ON (HIGH)
18	Lens HP Sensor		
19	4th/5th Mirror HP Sensor		
20	Toner End Sensor	ON (HIGH)	OFF (LOW)
21	Toner Overflow Sensor	Used toner holder full (HIGH)	Used toner holder not full (LOW)
22	Color 1 Switch	Color development unit installed.	Black development unit installed.
23	Color 2 Switch		
24	Duplex Entrance Sensor	Paper not detected (HIGH)	Paper detected (LOW)
25	Duplex Turn Sensor		
26	Duplex Paper End Sensor		
27	Duplex Jogger HP Sensor	OFF (LOW)	ON (HIGH)
28	Sorter Paper Sensor	Paper not detected (HIGH)	Paper detected (LOW)
29	Sorter Wheel switch	Switch is off.	Switch is on.
30	Sorter HP Switch	Switch is on.	Switch is off.

Input No.	Sensor/Switch/Signal	Data	
		0	1
31	Sorter Switch	Sorter opened	Sorter closed
32	ADF ON Line	ADF not installed	ADF installed
33	ADF Lift Sensor	ADF closed	ADF opened
34	APS Sensors	Refer to the following explanation	

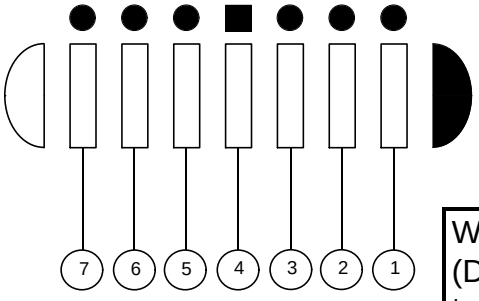
Input No. 34

The A054 Copier has 7 different sensors for detecting the original length and width in APS mode. The platen cover position sensor (DF position sensor) and the platen cover closed sensor are used for the original size detection timing.

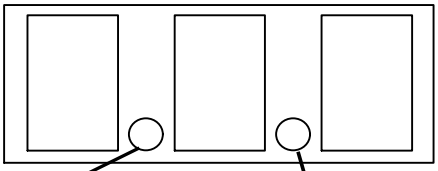
1) When an original length sensor or an original width sensor detects the original, the manual image density indicator (7 LEDs) corresponding to the sensor will light.
   Original detected Original not detected
2) When the platen cover position sensor and/or the platen cover closed switch are turned on, the point indicator in the magnification ratio indicator will light.
   Sensor/Switch ON Sensor/switch OFF



1) Manual Image Density Indicator



2) Magnification Ratio Indicator



When platen cover (DF) position sensor turns on, this point indicator will light.

When the platen cover closed switch turns on, the point indicator will light.

2.4 SP-9 ELECTRICAL COMPONENT CHECK

- How to turn electrical components on/off -

1. Enter "9", then press the Enter (#) key while pressing the Point key.
2. Enter the desired output number. (See the following table.)
3. Press the Start key to turn on the electrical component.
4. Press the Clear/Stop key to turn off the electrical component.

CAUTION: To prevent the paper lift gear and sector gear from being damaged, remove the first cassette before turning on the lift clutch solenoid (No. #27).

Output No.	Electrical Component
1	Main Motor (PTL and Quenching Lamp)
2	Charge Corona + Standard Grid (Grid Voltage = –920 volts)
3	Charge Corona + ID Sensor Grid (Grid Voltage = –660 volts + Vp Correction Factor)
4	Charge Corona + Vrp Grid (Grid Voltage = –500 volts)
5	Transfer Corona (One sided copy)
6	Transfer Corona (Two sided copy)
8	Separation Corona
9	ID Sensor LED
10	Development Drive Clutch
11	Toner Supply Clutch Solenoid
14	Sorter DC Motor
15	Sorter Wheel Motor (Bin up)
16	Sorter Wheel Motor (Bin down)
17	Registration Clutch
18	1st Paper Feed Clutch Solenoid
19	Relay Roller Clutch Solenoid
23	2nd Paper Feed Clutch Solenoid
24	3rd Paper Feed Clutch Solenoid (**used only on the A054 copier**)
27	Cassette Lift Clutch Solenoid
28	Duplex Gate Solenoid (Paper tray must be inserted.)
29	Pick-up Roller Release Solenoid
30	Duplex Feed Motor (Stack) (Paper tray must be inserted.)
31	Duplex Feed Motor (Feed) (Paper tray must be inserted.)
32	Duplex Jogger Motor (Home Position) (Paper tray must be inserted.)
33	Duplex Jogger Motor (A4 size) (Paper tray must be inserted.)
34	Duplex Jogger Motor (B5 size) (Paper tray must be inserted.)
35	Duplex Jogger Motor (LT size) (Paper tray must be inserted.)

Output No.	Electrical Component
37	Erase Lamp
39	Optics Cooling Fans
40	Exposure Lamp + Optics Cooling Fans
42	Charge Corona + Standard Grid + Transfer Corona + Separation Corona
43	Charge Corona + ID Sensor Grid + Transfer Corona + Separation Corona
44	Charge Corona + VR Grid + Transfer Corona + Separation Corona
50 - 57	Applies bias voltage in 40V steps starting at 120V
60 - 67	Applies grid voltage in 60V steps starting at 560V

NOTE: Disconnect the duplex entrance sensor connector before using SP Mode #9-30 to check the duplex tray paper path. Otherwise, RA401 on the ac drive board will turn on and off (the misfeed indicator blinks) whenever the entrance sensor is actuated by a paper sheet.

2.5 MISFEED TABLE

2.5.1 Number of PaperJams (SP Mode #131)

The following explains how to access a record that gives the number of paper jams by copier location.

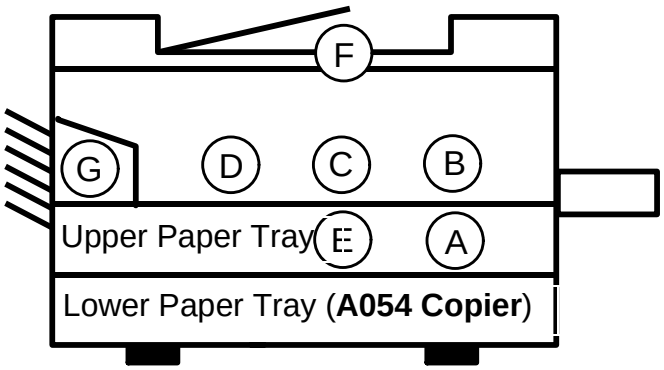
1. Enter "131" with the numeric keys.
2. Press the Enter (#) key while pressing the Point key.
3. Select the desired FC code (Function Code).

   The FC code can also be selected with the "+" and "–" (zoom "up" and "down") keys.
4. Hold down the "." key to display the jam counter in the second three digits of the Magnification indicator.

   Release the "." key to display the first three digits.

FC Code	Jam Area/Detection
1	Paper Misfeed Jam (Registration Sensor Not ON)
2	Exit Jam (Exit Sensor Not ON or OFF)
3	Sorter Jam (Sorter Paper Sensor Not ON or OFF)
4	DF Jam (DF Sensors Not ON or OFF)
5	Duplex Jam (Entrance Sensor Not ON, Turn Sensor not ON or OFF in Stack Mode, Registration Sensor Not ON in Feed Mode)

2.5.2 Paper Misfeed Location Indicator



1. Initial Misfeed

Misfeed location indicators turn on if paper is detected by sensors when the main switch is turned or when the front cover/exit cover is closed. Sensors and indicators are listed below.

ITEM NO.	SENSOR		MISFEED LOCATION INDICATOR
1	Registration Sensor	Using cassette or manual feed table	B and C light
		Using upper or lower paper tray (**NOTE 2**)	A and C light
		Using duplex tray	A and C light
2	Exit Sensor		D lights
3	Sorter Paper Sensor		G lights
4	Duplex Entrance Sensor		E lights
5	Duplex Turn Sensor		A lights

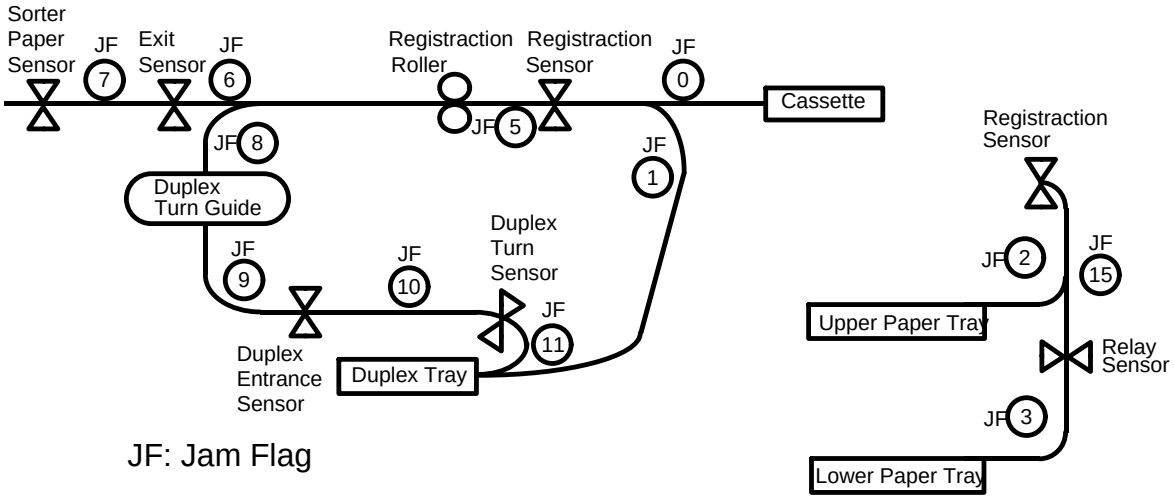
2. Misfeed during copy cycle (Misfeed Detection)

A paper misfeed indicator starts blinking to indicate that a paper jam has been detected during the copy cycle. Sensors and indicators are listed below.

ITEM NO.	SENSOR		MISFEED LOCATION INDICATOR
1	Registration Sensor Not ON (ON check jam)	Using cassette or manual feed table	B blinks
		Using upper or lower paper tray (**NOTE 2**)	A blinks
		Using duplex tray	A blinks and E lights
2	Exit Sensor Not ON (ON check jam)		D blinks
3	Sorter Paper Sensor Not ON (ON check jam)		G blinks
4	Duplex Entrance Sensor Not ON (ON check jam)		D blinks
5	Duplex Turn Sensor Not ON (ON check Jam)		E blinks
6	Exit Sensor Not OFF (OFF check jam)		D blinks
7	Sorter Entrance Sensor Not OFF (OFF check jam)		G blinks
8	Duplex Turn Sensor Not OFF (OFF check jam)		E blinks
9	Registration Sensor Not ON (ON check jam) (**NOTE 2**)		C blinks

3. Misfeed during copy cycle (Misfeed Location)

1. The misfeed location indicator turns on (and stays lit) to indicate the location of a misfeed detected by a sensor during the copy cycle.
2. The CPU determines the position of the copy leading edge by checking jam flags "0" through "15". The CPU then turns on the misfeed location indicator.



JF: Jam Flag

ITEM NO.	SENSOR	MISFEED LOCATION INDICATOR
Misfeed location detected by sensor		
1	Registration Sensor ON	C lights
2	Exit Sensor ON	D lights
3	Sorter Paper Sensor ON	G lights
4	Duplex Entrance Sensor ON	E lights
5	Duplex Turn Sensor ON	E lights
6	Relay Sensor ON (**NOTE 2**)	A lights
Misfeed location detected using jam flags		
7	Jam Flag "0" ON	B lights
8	Jam Flag "5", "6", or "8" ON	C lights
9	Jam Flag "7" or "9" ON	D lights
10	Jam Flag "10" or "11" ON	E lights
11	Jam Flag "2", "3", or "15" ON (**NOTE 2**)	A lights
12	Jam Flag "1" ON	E and A light

NOTE1: 1. If the misfeed location indicator is blinking and a misfed sheet is detected under the corresponding sensor, the indicator continues to blink. (Normally, the indicator stays lit to indicate the misfeed location.)

2. If a paper misfeed is detected by the registration sensor ON check during a multi-copy run, the misfeed location indicator turns on after copies that began the copy cycle before the paper jam are completely feed out from the copier.

3. If an original misfeed occurs in the DF, the misfeed indicator "F" blinks.

NOTE2: The A054 copier has an additional feed station: the lower paper tray. When the lower paper tray is in use, the following apply:

1. The misfeed location "A" and "C" indicators will light if the registration sensor turns ON during the check for an initial misfeed**.**

2. The misfeed location "A" indicator will blink if the relay sensor does not turn on during the copy cycle.

3. During the copy cycle, the misfeed location "C" indicator will blink if the registration sensor does not turn on after the relay sensor turns on.

4. The misfeed location "A" indicator will light if the relay sensor detects a paper misfeed.

5. Jam flags "3" and "15" have been added for the 2nd paper tray misfeed condition check.

2.6 SERVICE CALL AND USER CODE TABLE

SERVICE CALL CODES

E-CODE	CONTENTS	SP Mode No. (SC Counter)
11	**Exposure Lamp Error** The feed back signal beomes higher than 4.2 volts (r.m.s) for 1.0 second when the exposure lamp is on, or it becomes higher than 1.0 volt (r.m.s) for 1.0 second when the exposure lamp is off.	SP Mode #122 (Exposure Lamp)
12	**Exposure Lamp Error** The feed back signal falls below 0.5 volt (r.m.s) for 1.0 second when the exposure lamp is on, or the exposure lamp stays on for longer than 10 seconds.	
13	**Zero Cross Signal Error** The CPU does not receive the zero cross signal within 0.56 second.	–
21	**Scanner Home Position Error** The scanner home position sensor remains off (LOW) 8 seconds after the main switch is turned on.	SP Mode #121 (Optics)
22	**Scanner Home Position Error** The scanner home position sensor still on (HIGH) 1.0 second after the scanner starts.	
28	**Lens Home Position Error** The lens home position sensor remains off (LOW) 3.5 seconds after the lens move to the home position.	
29	**Lens Home Position Error** The lens home position sensor is still on (HIGH) 3.5 seconds after the lens leaves the home position.	
2A	**4th/5th Mirror Home Position Error** The 4th/5th mirror home position sensor is still on (HIGH) 2.5 seconds after the 4th/5th mirror assembly moves to the home position.	
2B	**4th/5th Mirror Home Position Error** The 4th/5th mirror home position sensor is still off (LOW) 2.5 seconds after the 4th/5th mirror assembly leaves the home position.	
52	**Fusing Warm-up Error** The temperature detected by the thermistor does not reach 175 ^{o}C within 100 seconds after the main switch is turned on.	SP Mode #124 (Fusing Section) **Refer to NOTE b)**
53	**Fusing Overheat** The temperature detected by the thermistor becomes higher than 240 ^{o}C.	
55	**Fusing Thermistor Open** The temperature detected by the thermistor does not reach 2 ^{o}C within 30 seconds after the main switch is turned on.	

E-CODE	CONTENT	SP Mode No. (SC Counter)
70	**Toner Overflow Sensor ON** When the toner overflow sensor is on, "E70" blinks in the magnification indicator. Up to 250 copies additional can be made. After 250 copies are made, "E70" lights and copies cannot be made.	—
80	**Duplex and Copier Main Board Communication Error** The copier main board does not receive any signal from the duplex main board.	SP Mode #125 (Interface Comunication)
81	**Interface Board Error** The interface board is not connected when the duplex unit is installed.	
82	**Jogger Home Position Error** The output of the jogger home position sensor remains LOW as the duplex main board is driving the jogger fences outward.	
83	**Jogger Home Position Error** The output of the jogger home position sensor remains HIGH as the duplex main board is driving the jogger fences inward.	^

NOTE: a) E-codes (E1 to E8) are displayed in the copy counter. To display the two digits, press the Enter key.

Example:
When the machine detects the E11 condition, E1 is displayed in the copy countrer. Hold down the Enter key, and "11" is displayed in the copy counter.

b) When the service call (E5) conditions occur, for safety reason they cannot be cleared by turning off/on the main switch. The following procedure must be performed to clear these service call conditions:

1. Turn on the main switch.
2. Turn DIP switch 101-1 on and off.
3. Turn the main switch off and on.

USER CODES

U-CODE	CONTENTS
1	Right Cover Open
2	Key Counter Not Set
3	Development Unit Not Set
4	Sorter Open
5	Cassette Lift Sensor Not ON (Cassette is not properly set.)

3. SERVICE REMARKS

3.1 GENERAL CAUTION

To prevent physical injury, keep hands away from the mechanical drive components in the following two cases:

a. If the Start key is pressed before the copier finishes the warm-up cycle, (Ready indicator starts blinking) the copier starts making copies as soon as the warm-up cycle is completed.
b. If the main switch is turned on while the first cassette is in the down position, the main motor starts rotating as soon as the warm-up period is completed.

3.2 DRUM

1. Never touch the drum surface with bare hands.
2. Store the drum in a cool dry place.
3. Always wear gloves when cleaning the drum.
4. Do not leave the drum exposed to light for long periods of time.
5. Drum Initial Setting (SP No. 66) must be done after installation of a new drum.

NOTE: Drum initial setting does not need to be done when a new machine is installed; this is done at the factory.

6. Always keep the drum in the protective sheet when inserting or pulling the drum out of the copier. This protects the drum from light, thus preventing drum fatigue.
7. Before inserting or pulling out the drum, do the following to prevent drum damage:
    a) Remove the cleaning unit.
    b) Remove the development unit.
    c) Remove the charge corona unit.
    d) Lower the transport unit.
8. Before pulling out the drum, place a sheet of paper under the drum to catch any dropped toner.
9. Dispose of used drums according to local regulations.

3.3 CHARGE CORONA

1. Clean the corona wire by sliding the corona unit in and out. (The cleaner pads come into contact with the corona wire when the corona unit is slid all the way out.) The wire and casing can also be cleaned with alcohol or water. Do not use sandpaper or a solvent.
2. Do not touch the corona wire with oily hands. Oil stains may cause white bands on copies.
3. Make sure that the corona wire is correctly positioned between the cleaner pads and that there is no foreign material (iron filings, etc.) on the casing.
4. When installing a new corona wire, be sure to place the damper ring in the front end block. (See Charge Corona Wire Replacement.)
5. When adjusting the drum current, always make sure that the axis of the drum shoe is aligned with the corona wire.
6. Clean the charge grid with a blower brush (not with a cloth).
7. The corona height should only be adjusted in the following two cases:

    a) When the front end block is replaced
    b) When the drum charge current is uneven

3.4 OPTICS

1. The following parts are very difficult to adjust. Do not adjust them.

    a) 4th/5th Mirror Home Position Sensor
    b) Lens Home Position Sensor
    c) Lens and 4th/5th Mirror Guide Rails

2. Before removing a sensor bracket to replace a sensor, mark the position of the bracket. Check the copy image (magnification and focus) to determine the exact location of the sensor.
3. Do not bend or damage the lens/scanner support plate or the mylar strip.

4. Clean the following parts with a silicone cloth:

   Lens and 4th/5th Mirror Guide Rails
   1st Scanner Guide Plate

5. Clean the exposure glass with glass cleaner and a dry cloth to reduce the amount of static electricity on the glass surface.
6. Only used water or a silicone cloth to clean the mirrors.
7. Do not touch the following parts with bare hands:

   Reflectors
   Exposure Lamp
   Mirrors and Lens

8. Do not bend the exposure lamp flat cables at sharp angles.
9. After adjusting the light intensity (SP No.48), check and adjust the following items:

   a) ADS Voltage (SP No.56)....2.5 ± 0.1V
   b) Vsg (SP No.54).... 4.0 ± 0.2V

3.5 DEVELOPMENT UNIT

1. Be careful not to nick or scratch the development roller sleeve.
2. Place the development unit on a sheet of paper after removing it from the copier.
3. Be careful not to bend the bias terminals.
4. Clean the drive gears after removing used developer.
5. Never load black developer or toner into the color development unit; never load color developer or toner into the black development unit.
6. Developer initial setting is necessary when the developer is replaced, or when a new color development unit is installed.

   a) Black Developer Initial Setting (SP No.65)
   b) Color Developer Initial Setting (SP No.10)

8. Dispose of used developer according to local regulations.

3.6 TONER SUPPLY

1. Clean the image density sensor with a blower brush.
2. Do not touch the sensor pattern with bare hands.
3. Image density sensor adjustment is required in the following cases:

    a) When the ID sensor is replaced
    b) When the main board is replaced
    c) When the drum has been replaced and Vsg is out of specification
    d) When there have been problems with toner supply and the ID sensor check shows Vsg to be out of specification
    e) When the exposure lamp voltage is changed

4. Toner supply unit initial setting (SP No.63) must be done when the machine is installed or the toner supply unit is replaced.

3.7 TRANSFER AND SEPARATION

1. Clean the corona wires and casing with alcohol or water.
2. When adjusting the drum current, always make sure that the axis of the drum shoe is aligned with the corona wire.

3.8 CLEANING UNIT

1. When servicing the cleaning unit, be careful not to damage the edge of the cleaning blade.
2. Do not touch the cleaning brush with bare hands.
3. Before pulling out the cleaning unit, place a sheet of paper under it to catch any toner that spills out.
4. When inserting the cleaning unit into the copier, be sure the cleaning unit rail is properly engaged with the unit guide rail on the copier.
5. Empty the used toner holder every service call.
6. Dispose of used toner according to local regulations.

3.9 FUSING UNIT

1. Be careful not to damage the edges of the hot roller strippers or their tension springs.
2. Do not touch the fusing lamp with bare hands.
3. Make sure that the fusing lamp does not touch the hot roller.

3.10 PAPER FEED

1. Do not touch the pick-up, feed, and reverse rollers with oily hands.
2. Non-standard size copy paper may bind against the cassette side and/or back fences and misfeed. Reposition the fences.

   Example:
   With an A4/LT (sideways) cassette, the proper paper width is 296mm. 297.5mm width paper binds against the cassette fences and does not feed correctly.

3. A worn out registration roller causes paper to crease. It should be replaced.

3.11 DOCUMENT FEEDER

1. Do not bend the DF interface harness at a sharp angle. This damages the fiber optics cables.
2. When installing or reinstalling the document feeder, make sure that the document feeder is in the open position.
3. A buildup of static electricity on the exposure glass can cause originals to jam. Apply silicon oil to the glass to reduce the amount of friction.

3.12 SORTER

1. The sorter has two types of bins, odd numbered and even numbered, which are installed in alternating sequence. Be sure to install them in the correct order.
2. If the bins do not operate smoothly, lubricate the slot liners and transfer wheels using grease 501 or an equivalent type.

3.13 DUPLEX

When lifting the duplex unit out of the duplex tray, hold both sides of the duplex unit frame.

3.14 OTHERS

1. If the toner density in solid image areas decreases, shift the ID sensor bias level to '2' or '3' using SP#33.
2. If the RAM on the old main board is still usable, remove and place it on the new main board. Then, install the new main board to the copier.
3. After installing the new main board with the new RAM, clear the RAM memory using SP mode #99. (Do not clear RAM memory if you have placed the old RAM on the new main board.) Then, check and adjust the data of the following SP modes:

	Customer Requests	Copy Quality/Type of Machine
SP Mode Numbers	15, 16, 17, 19, 20, 21, 22, 23, 25, 27, 28, 29, 76, 77	12, 30-35, 41-44, 47, 48, 54, 56, 70, 71, 74

4. When replacing a sensor, do not overtighten the screws. This may damage the sensor.
5. If a customer reports that red image areas on the original do not appear on the copy, increase the image density. (Press the Manual Image Density key.)
6. Tighten securly the screws used for grounding the following PCBs when reinstalling them.
   - AC Drive Board
   - Optional DC Power Supply Board
   - TC/SC Power Pack
   - Main DC Power Supply Board
   - CC/Grid/Bias Power Pack
7. The RAM Board must be handled as follows:

WARNING: The RAM board has a lithium battery which can explode if handled incorrectly, replace only with same RAM board. Do not recharge, disassemble or burn this battery. Used RAM boards must be handled in accordance with local regulations.

4. SPECIAL TOOLS AND LUBRICANTS

Part Number	Description	Q'ty
A0069105	Drum Shoe Shaft	1
A0489500	Doctor Gap Gauge (1 pc)	1
A0069103	Scanner Wire Clamper (Omega Clamp)	1
A0069104	Scanner Positioning Pin (4 pcs)	1 set
A0089502	Grease G-40M	1
52059101	Gap Gauge - 0.1mm	1
52069600	Sensor Checker	1
52039501	Grease (Shinetsu Silicone G-501)	1
54429106	Drum Shoe	1
54479104	Shoe Adapter	1
54209504	Digital Thermometer	1
54209505	Digital Thermometer Probe	1
54209507	Digital Multimeter	1
54479078	Heat Resistance Grease (MT-78)	1
54209516	Test Chart OS-A3 (10 pcs/set)	
54209502	Test Chart OS-A3 (100 pcs/set)	

5. PREVENTIVE MAINTENANCE SCHEDULE

After performing preventive maintenance, do the following:

1. Set the lamp voltage with SP Mode No. 48. Make a copy of the O-S-A3 test chart at manual image density level 4 to confirm that the lamp voltage is set correctly. (See Exposure Lamp Voltage Adjustment.)
2. Select SP Mode No.56 and set the ADS to 2.5 ± 0.1V by turning VR101.
3. Select SP Mode No.54 and set Vsg to 4.0 ± 0.2V by turning VR102.
4. Make a sample copy.

NOTE: 1) Drum Initial Setting (SP#66) must be done after the drum is replaced.

2) Black Developer Initial Setting (SP#65) must be done after black developer is replaced.

3) Color Developer Initial Setting (SP#10) must be done after color developer is replaced.

5.1 PM TABLE

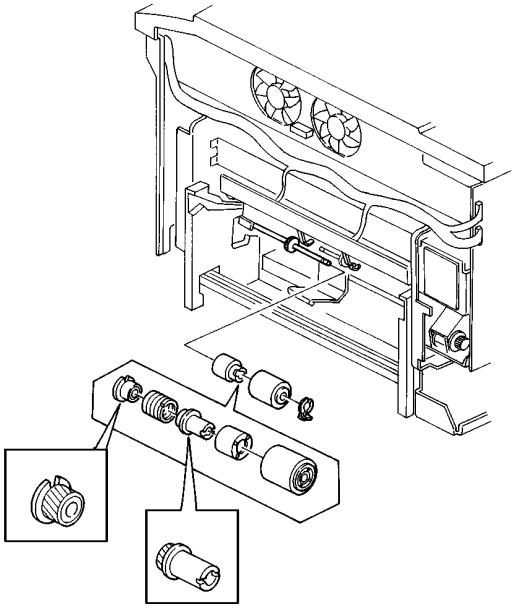
L = Lubricate R = Replace C = Clean I = Inspection

	EM	60K	120K	180K	240K	NOTES
A. OPTICS						
1. Mirrors, lens, reflectors, toner shield glass	C	C	C	C	C	Silicone cloth, cotton pad with water, or blower brush **NOTE**: Clean 6th mirror with blower brush.
2. Exposure glass	C	C	C	C	C	Alcohol or water
3. Platen cover sheet	C	R	R	R	R	Alcohol or water (replace if necessary)
4. Scanner guide rail		C	C	C	C	Dry cloth
5. Magnification guide rail		C	C	C	C	Dry cloth
B. PAPER FEED						
1. Paper feed roller (1st, 2nd, and 3rd)	C		R		R	Water
2. Pick-up roller	C		R		R	Water
3. Registration roller		C	C	C	C	Water (replace if necessary)
4. Relay roller		C	C	C	C	Water
5. Separation roller spring clutch (1st feed station)		L	L	L	L	Mobil temp 78 **Refer To NOTE 1**
6. Separation roller (1st feed station)	C		R		R	Water
7. Paper feed guide plate		C	C	C	C	Alcohol
8. Cassette bottom plate pad		C	R	C	R	Water
9. Paper tray bottom plate pad		C	R	C	R	Water
10. Manual feed bottom plate pad		C	R	C	R	Water
11. Registration Sensor		C	C	C	C	Blower brush
C. AROUND DRUM						
1. Corona wires	C	R	R	R	R	Alcohol or water
2. Wire cleaner		R	R	R	R	
3. Charge grid		C	R	C	R	Blower brush
4. End blocks and casing	C	C	C	C	C	Alcohol or water
5. Transfer guide plate		C	C	C	C	Dry cloth
6. Pre-Transfer lamp	C	C	C	C	C	Dry cloth, discharge any static before installation

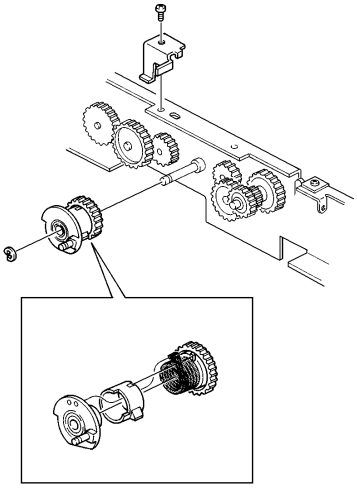
	EM	60K	120K	180K	240K	NOTES
7. Quenching lamp	C	C	C	C	C	Dry cloth, discharge any static before installation
8. ID sensor	C	C	C	C	C	Blower brush
9. Erase lamp unit	C	C	C	C	C	Dry cloth
D. CLEANING UNIT						
1. Cleaning blade			R		R	Replace if necessary
2. Cleaning seal		C	C	C	C	Replace if necessary
3. Cleaning brush			R		R	Replace if necessary
4. Pick-off pawls	C	C	C	C	C	Replace if necessary
5. Used toner bottle	C	C	C	C	C	Empty used toner
E. DEVELOPMENT UNIT						
1. Developer		R	R	R	R	Replace if necessary **Refer to NOTE 4**
2. Upper brush seal		C	C	C	C	
3. Side seals		C	C	C	C	
F. FUSING UNIT						
1. Hot roller		C	C	R	C	If necessary
2. Pressure roller		C	C	R	C	If necessary
3. Stripper pawls		C	C	C	C	Suitable solvent, replace if necessary
4. Fusing entrance and exit guides		C	C	C	C	Suitable solvent
5. Fusing thermistor		I	I	I	I	Suitable solvent, clean if necessary
G. OTHERS						
1. Ozone filter		R	R	R	R	
2. Drive belt		I	I	I	I	Replace if necessary
3. Bushings			L		L	Spindle oil
4. Exit Sensor		C	C	C	C	Blower brush
H. DOCUMENT FEEDER						
1. Transport Belt	C	C	R	C	R	Belt Cleaner
2. Separation Belt	C	R	R	R	R	Do not touch friction face
3. Pick-up Roller		C	C	C	C	Alcohol, replace if necessary
4. Separation Roller		C	C	C	C	Alcohol
5. Feed-in Clutch	L					Mobil Temp. 78

	EM	60K	120K	180K	240K	NOTES
J. SORTER						
1. Bin guide/wheel		L	L	L	L	Grease G501(if necessary)
2. Round Belt		C	C	C	C	Alcohol
3. Guide plate		C	C	C	C	Dry cloth
K. DUPLEX						
1. Feed roller	C		R		R	Replace if necessary
2. Friction roller	C		R		R	Replace if necessary
3. Bottom plate pad			R		R	Replace if necessary
4. Round belt		I	R		R	Replace if necessary
5. Spring clutch			L		L	Mobil temp 78, lubricate if necessary **Refer to NOTE 2**

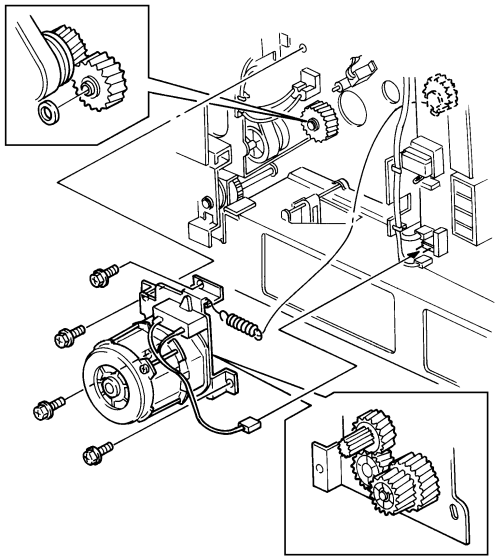
NOTE 1: Clean and lubricate the spring clutch of the reverse roller at every PM.



NOTE 2: Clean and lubricate the paper lift spring clutch of the duplex tray every 120K copies.



NOTE 3: When replacing the main motor, lubricate the gear using Grease G501.



NOTE 4: Replace the black and color developer at PM, refering to the following supply yield table, if necessary. The yield is different for the black and color developer due to the carrier characteristics.

DEVELOPER COLOR	TARGETED SUPPLY YIELD
Black	60K copies
Red	30K copies
Blue	30K copies
Green	30K copies

5.2 EXPLANATION OF REGULAR PM

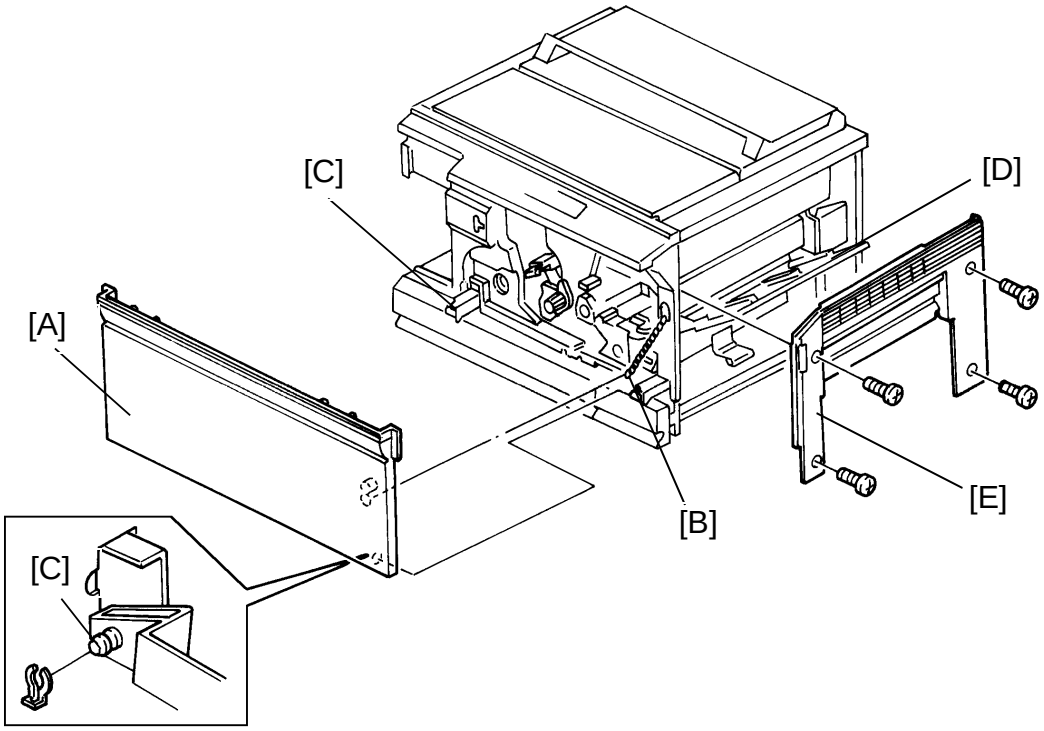
Item		Explanation
Optics Unit	Mirrors, Lens, Reflector, Exposure Glass, Platen Cover	Stains on any part of the optics unit result in a dirty background, black lines, or areas of decreased sharpness on the copy image. Periodic cleaning is required. The exposure glass and the platen cover must also be cleaned. If stains on the platen cover cannot be removed, it must be replaced.
	Exposure Lamp	Deterioration of the exposure lamp affects the copy image. Check the lamp at regular intervals and replace if discolored.
	Optical Fiber	A dirty optical fiber receptor can result in insufficient image density. Clean at regular intervals.
Paper Feed, Registration	Paper Feed Roller, Pick-up Roller, Separation Roller	This machine uses cassettes for paper feeding. If paper powder or dust adheres to the paper feed roller and rollers are worn out, paper may not feed correctly and/or skewing may result. Cleaning or replacement is required at regular intervals.
	Registration Roller	A dirty registration roller can cause paper to register incorrectly, skew, or jam. Cleaning is required at regular intervals.
Transport	Transfer Guide Plate	If the transfer guide plate is dirty, the back sides of the copy may become dirty. Clean the plate at regular intervals.
Around Drum	Charge Wires	Dirty charge wires may cause uneven image density. They should be cleaned or replaced at regular intervals.
	End Blocks	Toner tends to accumulate on the corona end blocks, and this can result in poor copy quality or even a high voltage leak. Clean end blocks at regular intervals.
	QL	If toner accumulates on the QL, a dirty background or a repeating negative image may result. Clean the QL at regular intervals.
	PTL	If paper dust or toner accumulates on the PTL, its efficiency may be reduced. This can cause toner to be reattracted to the drum during transfer, reducing image density. Clean the PTL at regular intervals.
	ID Sensor	If paper dust or toner accumulates on the ID sensor, the toner density cannot be controlled correctly. This results in light copy or overtoning. Clean this sensor at regular intervals.
	Erase Lamp	If toner accumulates on the erase lamp, a dirty background may occur that becomes progressively worse in long copy runs. Clean this lamp at regular intervals.
Cleaning Unit	Cleaning Blade	A dirty or worn out cleaning blade will cause black lines on copies and/or scratches on the drum. The blade must be replaced or cleaned at regular intervals.

Item		Explanation
	Cleaning Brush	A worn out cleaning brush will not clean effectively, resulting in a dirty background and damage to the cleaning blade. Replace at regular intervals.
Fusing Unit	Thermistor	If toner accumulates on the thermistor, fusing temperature control may not be accurate. Inspect the thermistor at regular intervals.
	Stripper Pawls	Toner or dust adhering to the stripper pawls can cause a paper jam. Clean or replace the pawls at regular intervals.
	Fusing Entrance and Exit Guides	Toner piling up on the guide plate will cause a dirty background on the copy. Clean the guide plate at regular intervals.
Duplex Unit	Paper Feed and Friction Rollers	The duplex unit uses the feed and friction roller (FFR) system. If paper dust or dust adheres to the paper feed and friction rollers and if the rollers are worn out, paper may not feed correctly and/or skewing may result. Cleaning or replacement is required at regular intervals.
	Transport Roller	A transport roller that is dirty or slips may cause a dirty copy image or a paper jam. Clean the rollers at regular intervals.
	Round Belt	The round belt transmits driving power to the turn guide roller. When the belt wears out (breaks or stretches), a paper jam may occur. Replace the belt at regular intervals.
ARDF	Transport Belt	A dirty transport belt can leave stains on copies. Clean or replace the belt at regular intervals.
	Pick-up Roller, Separation Roller, Separation Belt	When dirty, these rollers and this belt can leave stains on the copy paper. Clean or replace these parts at regular intervals.
Sorter	Bin Drive Wheel, Bin Guide	Dust adhering to the bin drive wheel or bin guide may interfere with bin movement and result in uneven bin positioning. Clean and lubricate if necessary.

SECTION 5
REPLACEMENT AND ADJUSTMENT

1. EXTERIOR AND INNER COVERS

1.1 EXTERIOR COVER REMOVAL

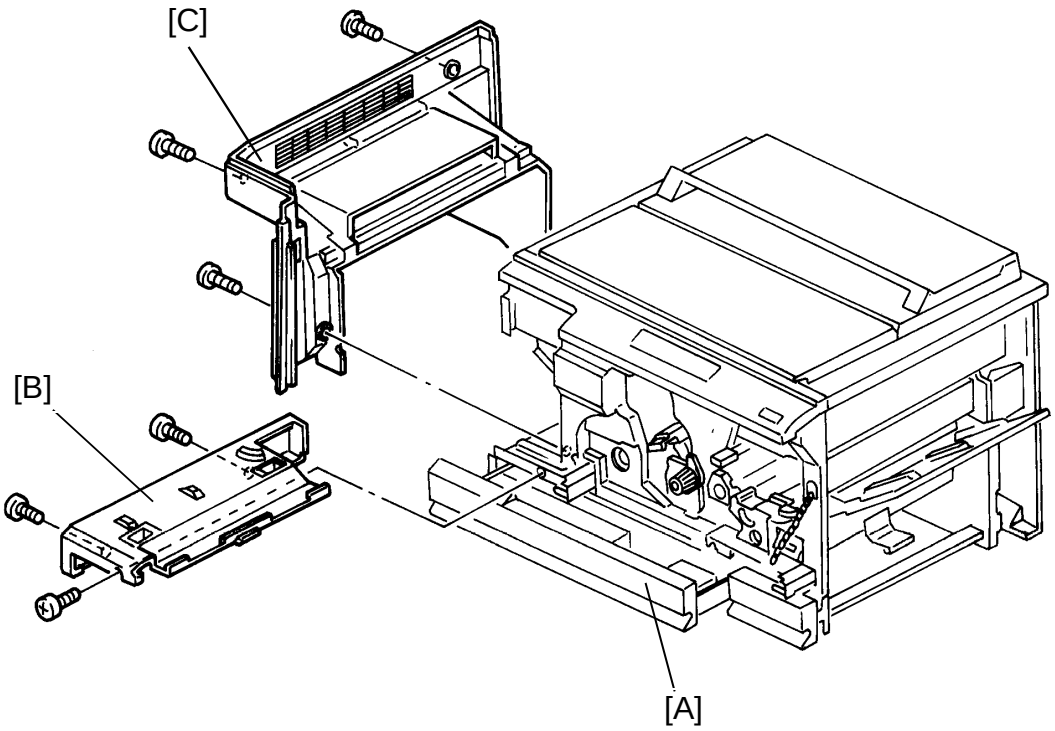


1.1.1 Front Cover

1. Open the front cover [A].
2. Unhook the chain [B] from the front cover.
3. Slide the front cover off the holding pins [C] (1 snap ring) and remove it.

1.1.2 Right Cover

1. Open the front cover and the manual feed table [D].
2. Remove the right cover [E] (4 screws).



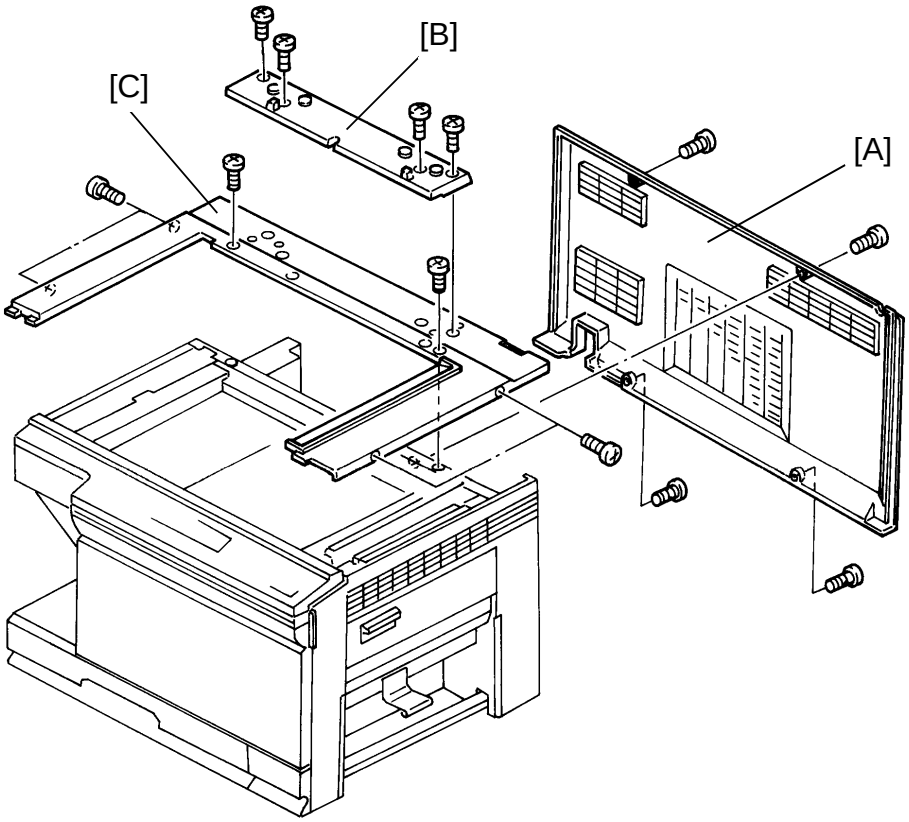
1.1.3 Left Lower Cover

1. Pull out the paper tray or the duplex tray [A].
2. Remove the left lower cover [B] (3 screws).

1.1.4 Left Upper Cover.

1. Remove the left lower cover.
2. Open the exit unit.
3. Remove the left upper cover [C] (4 screws).

NOTE: Remove the sorter if it is installed.



1.1.5 Rear Cover

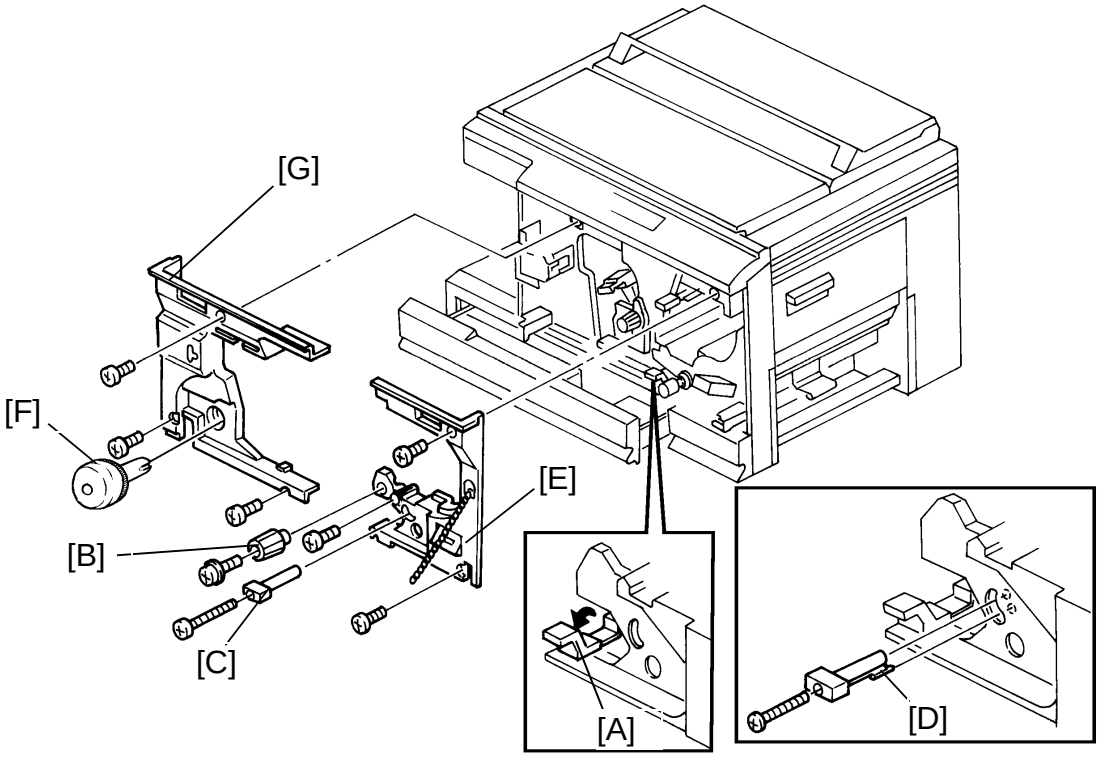
Remove the rear cover [A] (4 screws).

1.1.6 Upper Cover

1. Remove the platen cover.
2. Remove the platen cover pedestal [B] (4 screws).
3. Remove the upper cover [C] (6 screws).

NOTE: Remove the DF if it is installed.

1.2 INNER COVER REMOVAL



1.2.1 Right Inner Cover

1. Open and remove the front cover.
2. Remove the development unit.
3. Lower the turn guide lever [A].
4. Remove the registration knob [B] and paper guide release lever [C] (1 screw each).

NOTE: When reinstalling the release lever [C], make sure that the pin [D] on the lever is properly set in the paper guide.

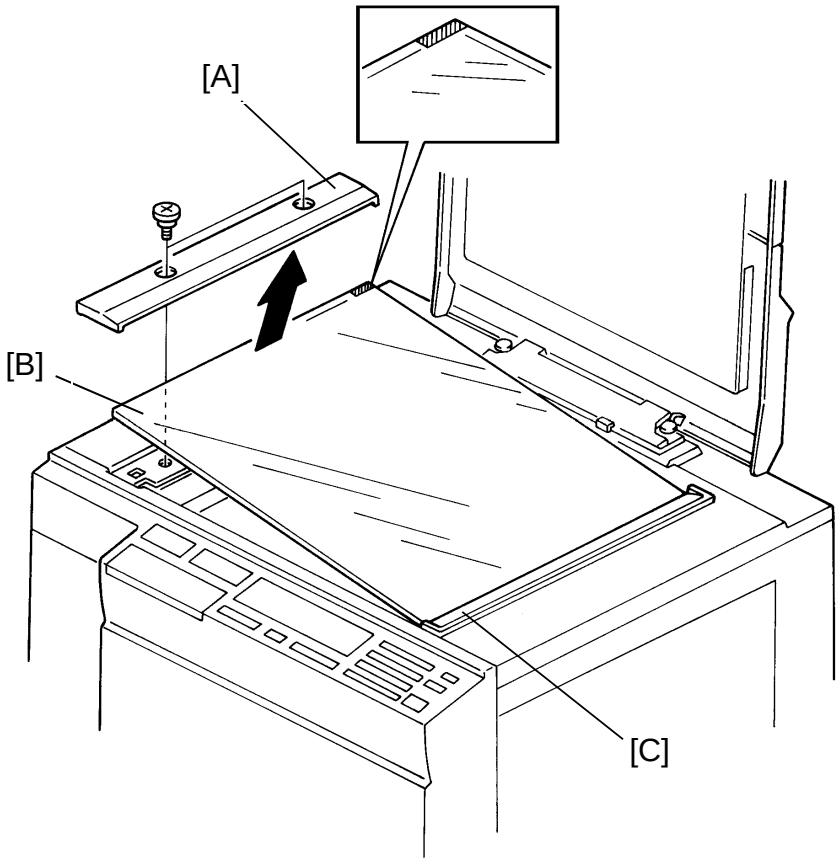
5. Remove the right inner cover [E] (3 screws).

1.2.2 Left Inner Cover

1. Open and remove the front cover.
2. Remove the fusing roller knob [F].
3. Remove the left inner cover [G] (3 screws).

2. OPTICS

2.1 EXPOSURE GLASS REMOVAL



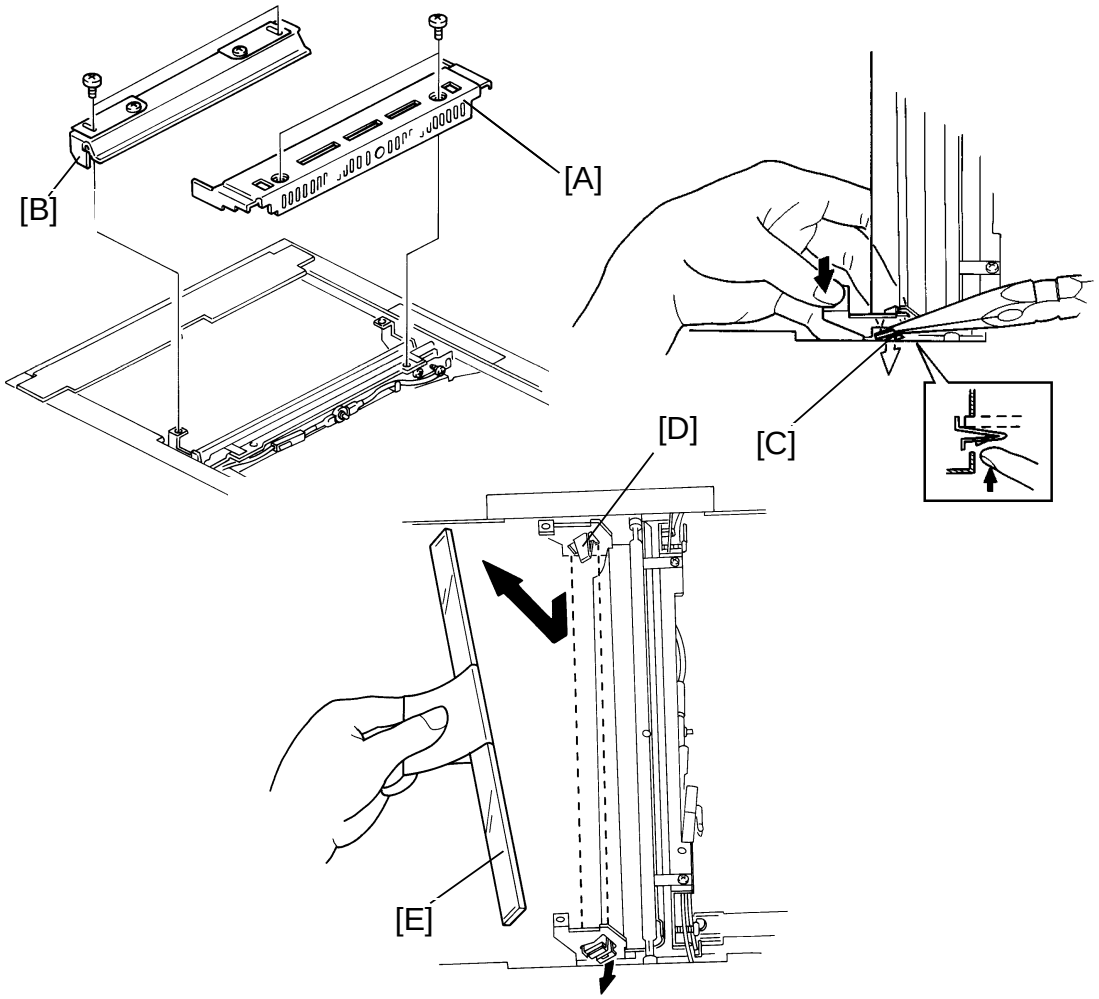
1. Take off the left scale [A] (2 short screws).
2. Grasp the left edge of the exposure glass [B] and lift up slightly. Slide the other edge out from under the right glass holder [C]. Remove the exposure glass.

NOTE: When reinstalling the exposure glass, make sure of the following:

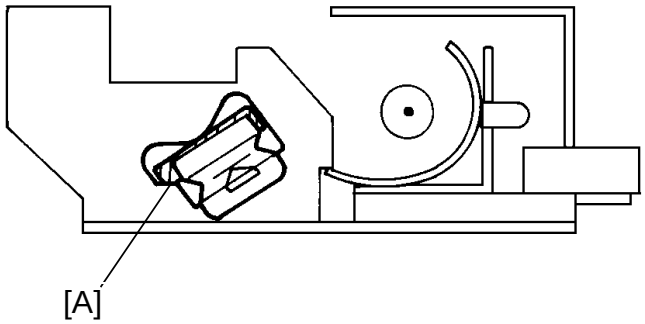
a) The left edge of the glass is flush with the tab to the left of the scale plate, and the right glass holder firmly secures the exposure glass.

b) The red mark on the edge of the glass faces up. This side is smoother and it generates less static electricity when the DF is used.

2.2 1ST MIRROR REMOVAL



1. Turn off the main switch.
2. Remove the exposure glass. (See Exposure Glass Removal.)
3. Move the first scanner to the cutout position (150 mm from the left scale).
4. Remove the reflector cover [A] (2 screws).
5. Remove the sub-reflector cover [B] (2 screws).
6. With your thumb, press down on the 1st scanner as shown to hold it in place. Then, while holding down the scanner, press up on the front spring plate [C] with another finger and remove the plate with a pair of pliers. Leave the rear spring plate [D] in position in the rear side plate cutout.
7. Carefully slide the 1st mirror [E] towards the front of the machine and lift the mirror out of the machine rear side first.



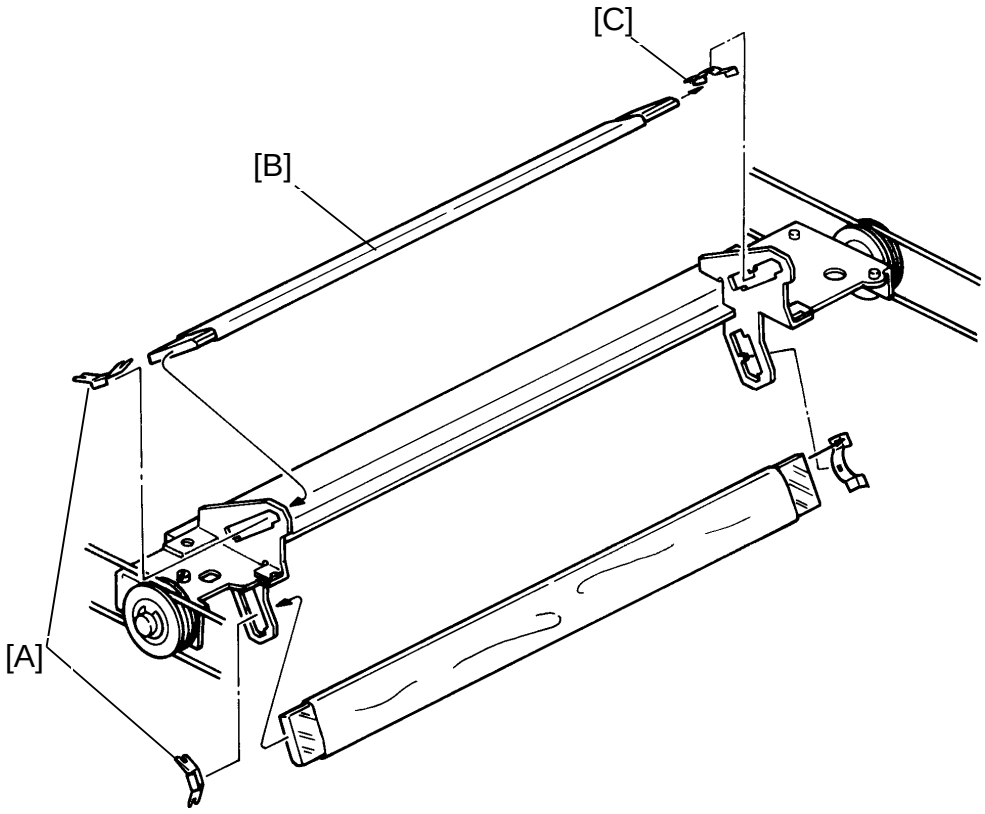
- To install -

1. Insert the 1st mirror into the front side plate cutout. Then insert the rear side of the mirror into the rear spring plate.

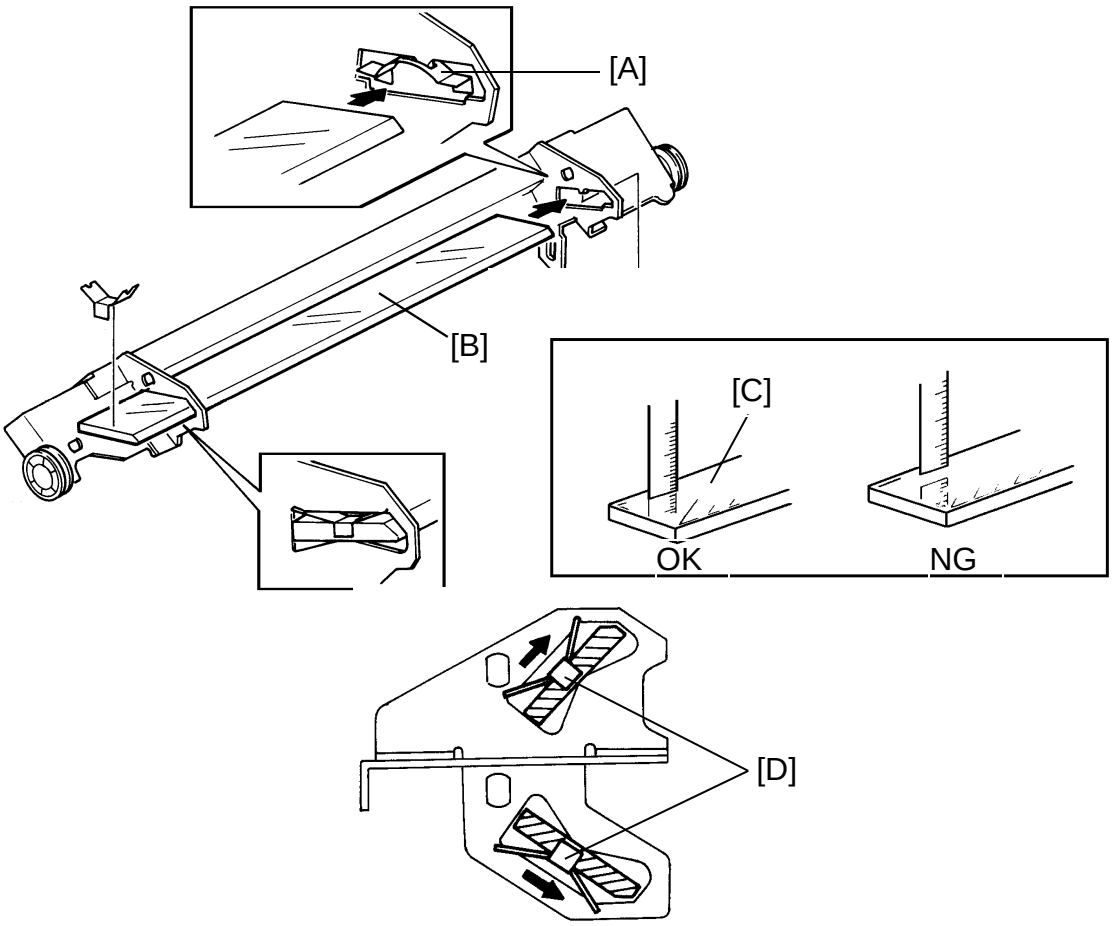
   NOTE: Make sure when installing the mirror that the reflecting surface is on the upper side and the beveled edge [A] of the mirror is on the lower side.

2. Insert the front spring plate between the mirror and the front side plate cut-out.

2.3 2ND AND 3RD MIRROR REMOVAL



1. Turn off the main switch.
2. Remove the exposure glass. (See Exposure Glass Removal.)
3. Slide the 1st scanner 2/3 of the way to the right.
4. Press down on one side of the front spring plate [A] and pull it off the end of the mirror.
5. Carefully shift the 2nd mirror [B] towards the front of the machine to remove the rear spring plate [C].
6. Lift the mirror out of the machine rear side first.



- To reinstall -

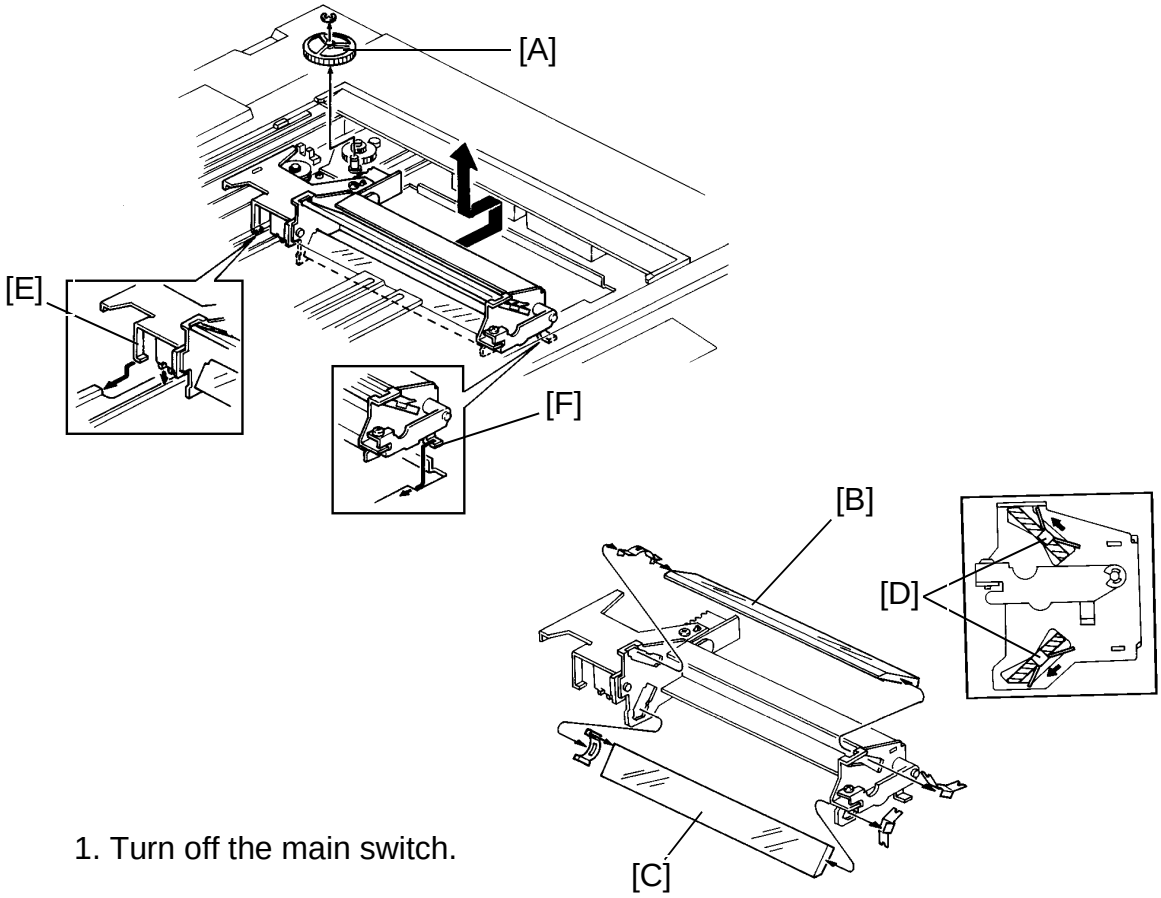
1. Hold the rear spring plate [A] in position as shown.
2. Insert the 2nd mirror [B] into the front side plate cutout.
3. Position the rear end of the mirror under the rear spring plate in the rear side plate cutout.
4. Fit the front spring plate over the front end of the mirror. Make sure that the slot on each arm of the spring plate fits over the edge of the cutout as shown.

NOTE: a) Make sure when installing the mirrors that the reflecting surfaces [C] face the lens.

b) The front and rear spring plates are different. Make sure that each plate is placed in the correct position.

c) Position the spring plate [D] by moving it in the direction of the arrow.

2.4 4TH AND 5TH MIRROR REPLACEMENT



1. Turn off the main switch.
2. Remove the exposure glass.
3. Remove the lens cover (2 screws).
4. Remove the 4th and 5th mirror assembly drive gear [A] (1 E-ring).
5. Slide the mirror assembly all the way to the right and remove it.
6. Replace the fourth [B] and fifth [C] mirrors. (The procedure for removing the mirrors from their brackets is the same as with the second and third mirrors.)

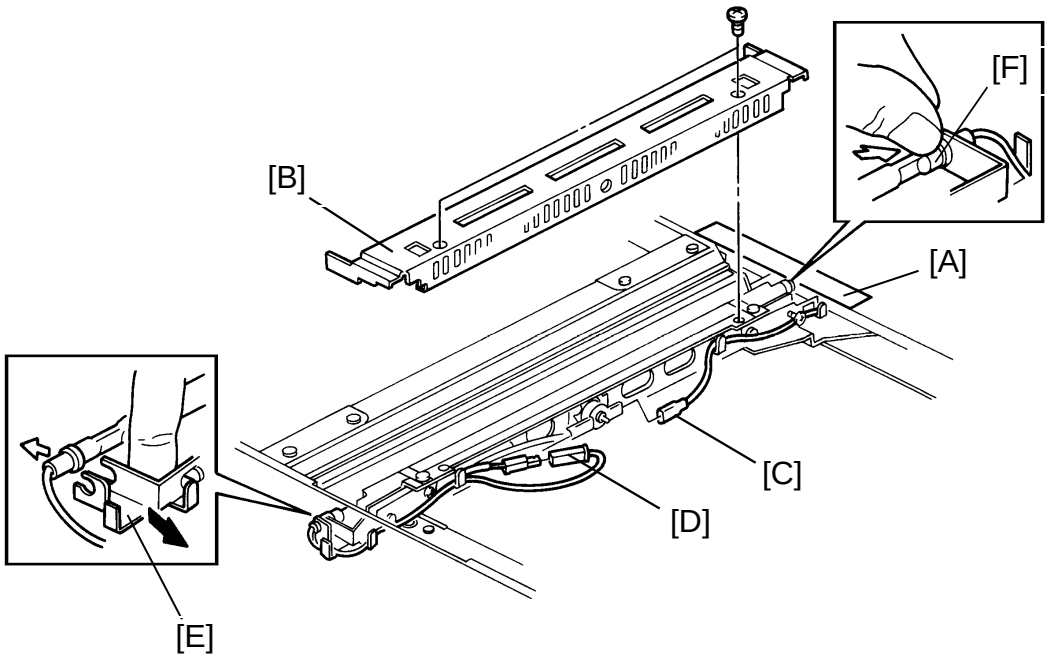
NOTE: a) Make sure that the mirrors are installed in their original positions. (The fourth mirror is larger than the fifth mirror.)

b) The front and rear spring plates are different. Be sure to mount them in the correct positions.

c) Position the spring plates [D] as shown. Move them in the direction of the arrow.

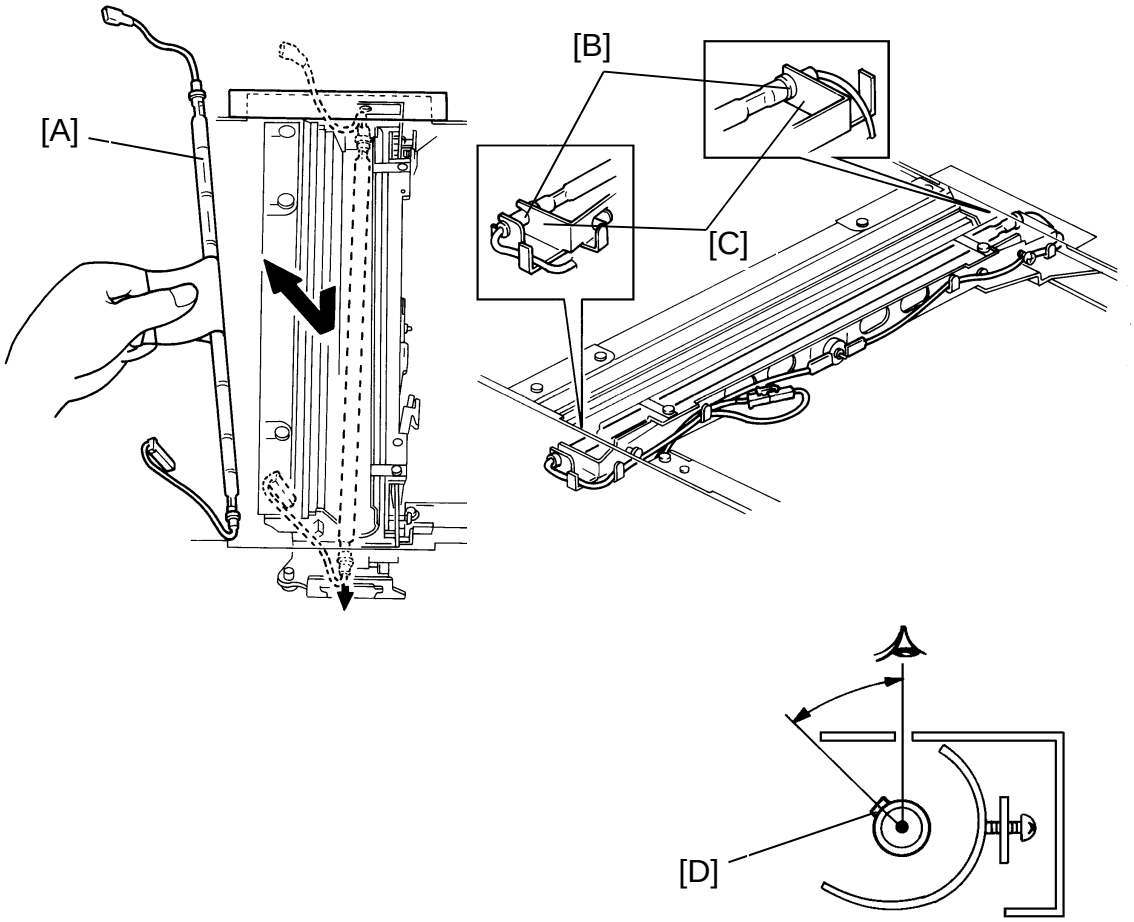
d) When reinstalling the 4th and 5th mirror assembly, make sure that the hooks [E and F] are properly positioned as shown.

2.5 EXPOSURE LAMP REPLACEMENT



NOTE: Do not touch the reflector or the new exposure lamp with your bare hands. Use a strip of paper as shown. (Oil marks from fingers on the lamp or reflectors will be affected by heat from the lamp and will cause discoloration.)

1. Turn off the main switch.
2. Remove the exposure glass. (See Exposure Glass Removal.)
3. Move the first scanner to the cutout position at the rear frame [A]. (See illustration.)
4. Remove the reflector cover [B] (2 screws).
5. Disconnect the exposure lamp wires [C] [D] (1 terminal and 1 connector).
6. Press the release lever [E] on the front terminal while pressing the insulator [F] of the lamp as shown.



7. Remove the exposure lamp [A] from the rear spring plate by moving the lamp toward the front.
8. Install a new lamp. Use a strip of paper as shown to hold the lamp. Set the rear terminal first.

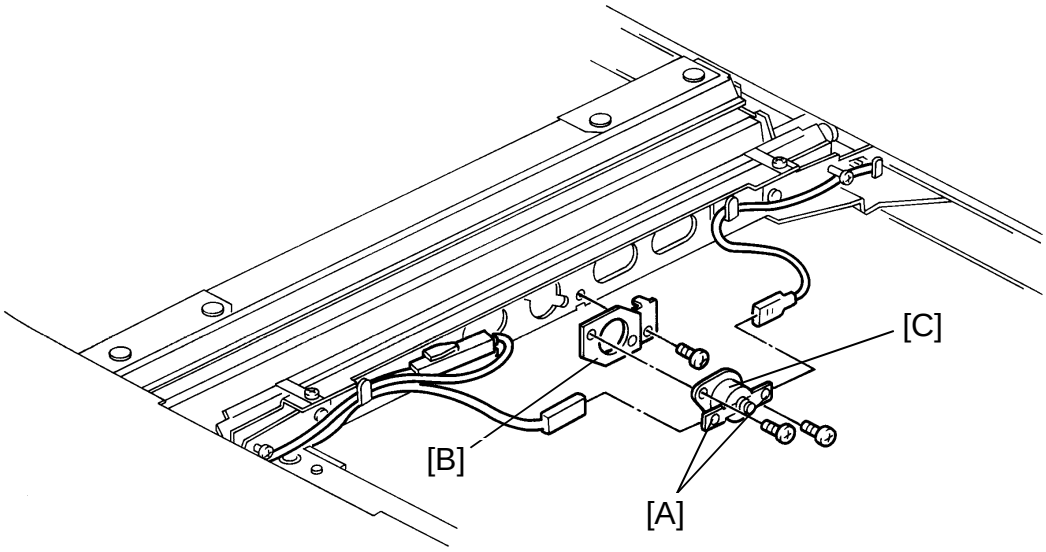
NOTE: a) Make sure that the lamp is set so that the terminal side of the exposure lamp routes through the rear side of the copier.

b) Make sure that the insulators [B] are properly supported with the terminals [C].

c) Make sure that the blister [D] on the lamp points towards the reflector opening (left side of the copier) as shown.

d) Check the exposure lamp position, light intensity and ADS sensor adjustment. (See Exposure Lamp Position Adjustment, Light Intensity Adjustment and ADS sensor Adjustment.)

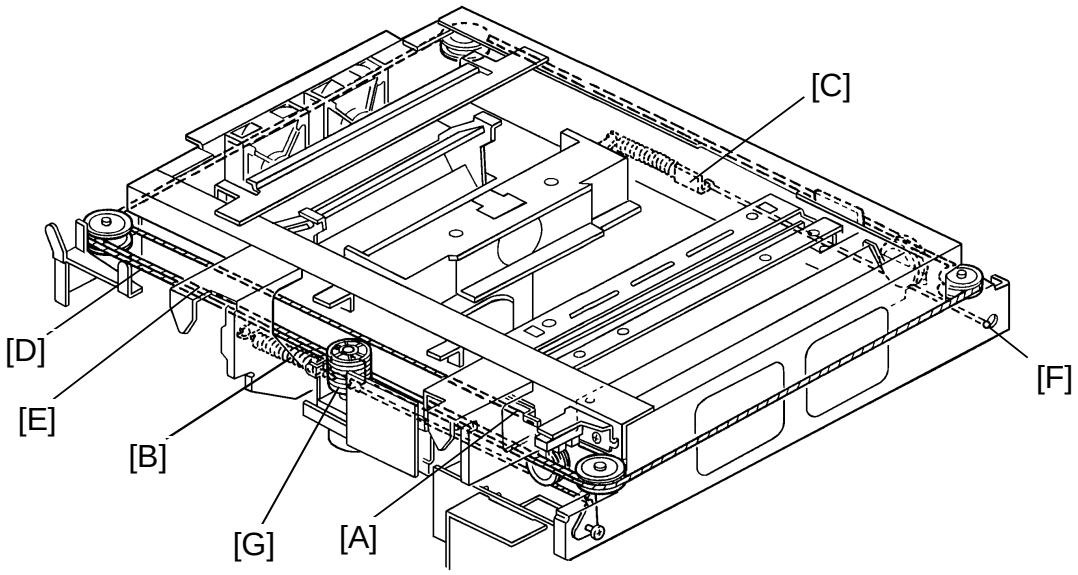
2.6 THERMOSWITCH REPLACEMENT



1. Turn off the main switch.
2. Remove the exposure glass (2 screws).
3. Slide the first scanner 150 mm to the right.
4. Remove the reflection plate cover (2 screws).
5. Remove the exposure lamp leads from the terminals [A] on both sides of the thermoswitch.
6. Remove the thermoswitch bracket [B] (1 screw).
7. Remove the thermoswitch [C] from the bracket (2 screws), and replace it.

2.7 SCANNER DRIVE WIRE REPLACEMENT

2.7.1 Wire Removal

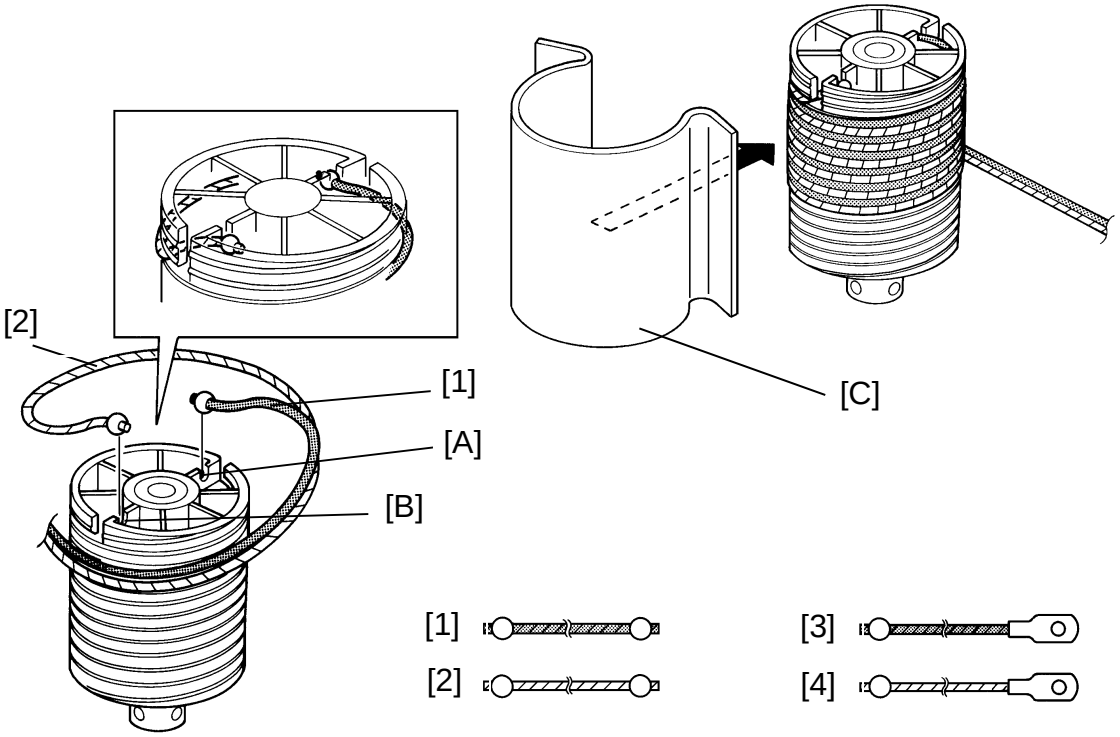


1. Remove the following covers and parts.

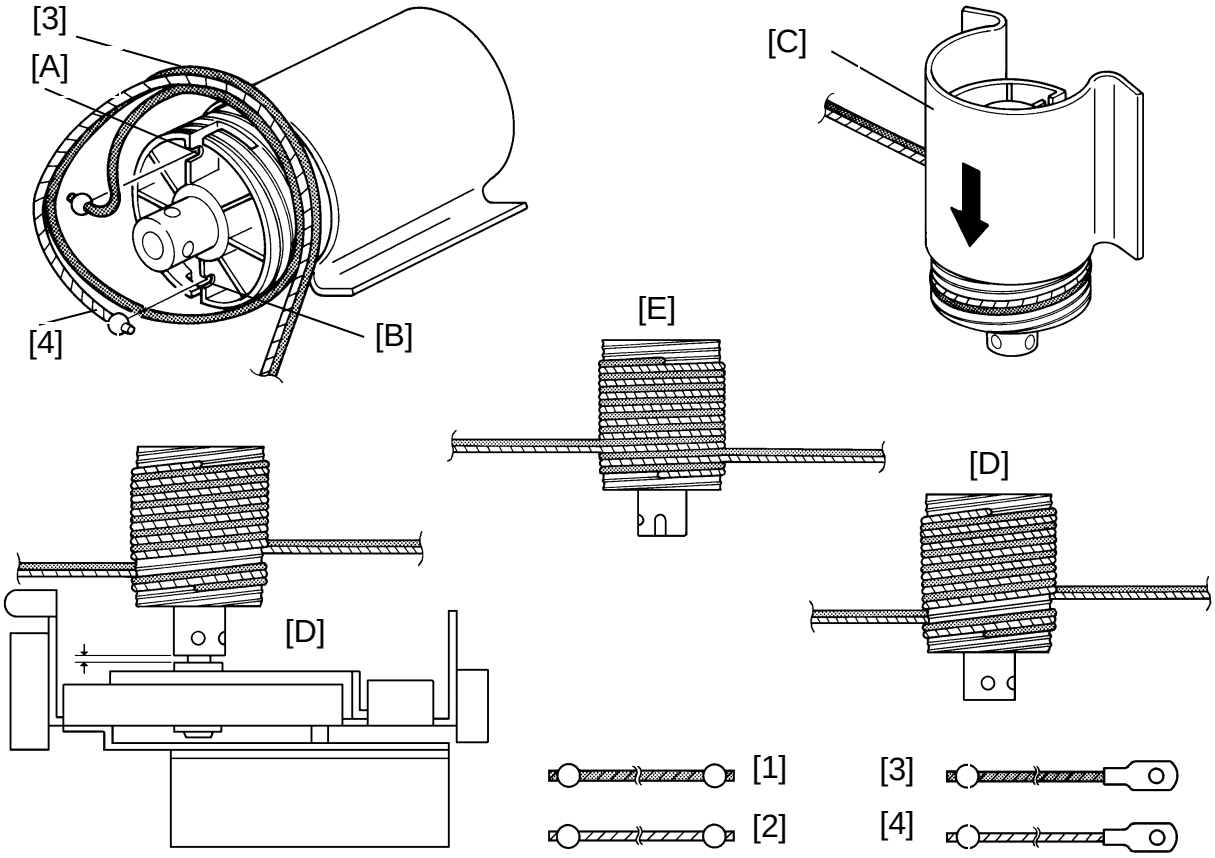
Sorter (if installed)	Document feeder (if installed)
Front cover	Development unit
Left and right inner covers	Left lower cover
Left upper cover	Rear cover
Right cover	Upper cover
Operation panel	Exposure glass
TC/SC power pack	

2. Loosen the screws securing the front and rear first scanner wire clamps [A].
3. Remove the front and rear wire tightened springs [B].
4. Loosen the screws securing the front and rear wire fixing plates [C].
5. Remove scanner wires [D] and [E] from the drive pulley.
6. Remove scanner wire [F] from the left side plate.
7. Remove scanner wire from the drive pulley [G].
8. Remove the drive pulley.

2.7.2 Wire Installation



1. Position the scanner drive pulley as shown with the Allen screws facing you.
2. Put the bead at the end of the blue wire [1] in slot [A] (opposite from the Allen screws).
3. Put the bead of the silver wire [2] in slot [B] on the Allen screw side.
4. Wind the blue wire [1] clockwise halfway around the pulley. Wind the silver wire [2] clockwise one complete turn around the pulley.
5. Wind the blue and silver wires together five and a half times around the pulley. Make sure that the blue wire is wound six times and the silver wire is wound six and a half times in total.
6. Set the omega clamp [C] over the wires on the drive pulley as shown.



7. Put the bead of the blue wire [3] in slot [A] on the Allen screw side.

8. Put the bead of the silver wire [4] in slot [B].

9. Wind the blue wire [3] clockwise one and a half times around the pulley. Wind the silver wire [4] once clockwise around the pulley.

10. Slide the omega clamp [C] down to secure all the wires as shown.

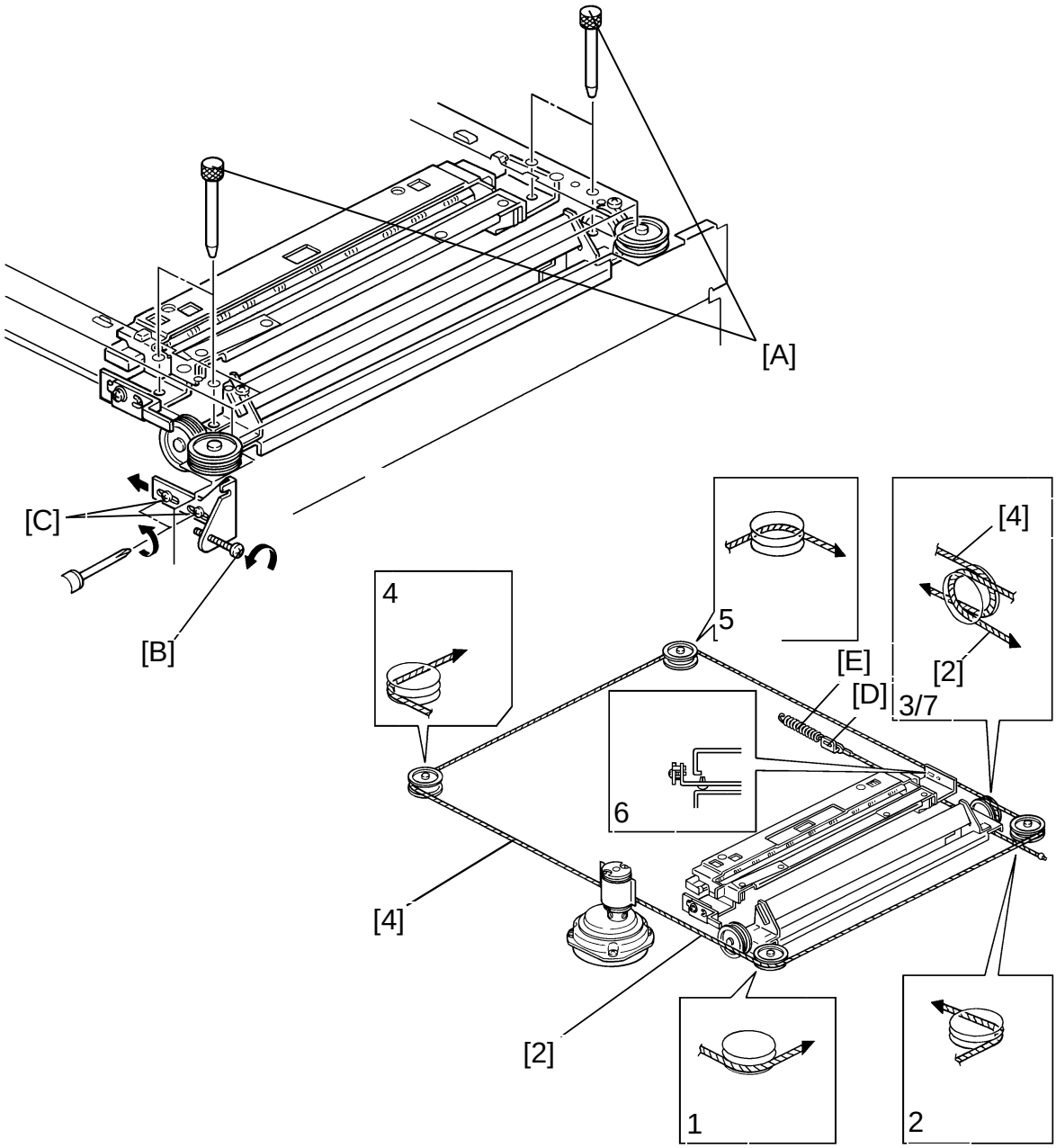
NOTE: a) The blue and silver wires alternate on the pulley with the blue wire uppermost.

b) Wires are not wound around the two grooves shown in the illustration (rear view [D]).

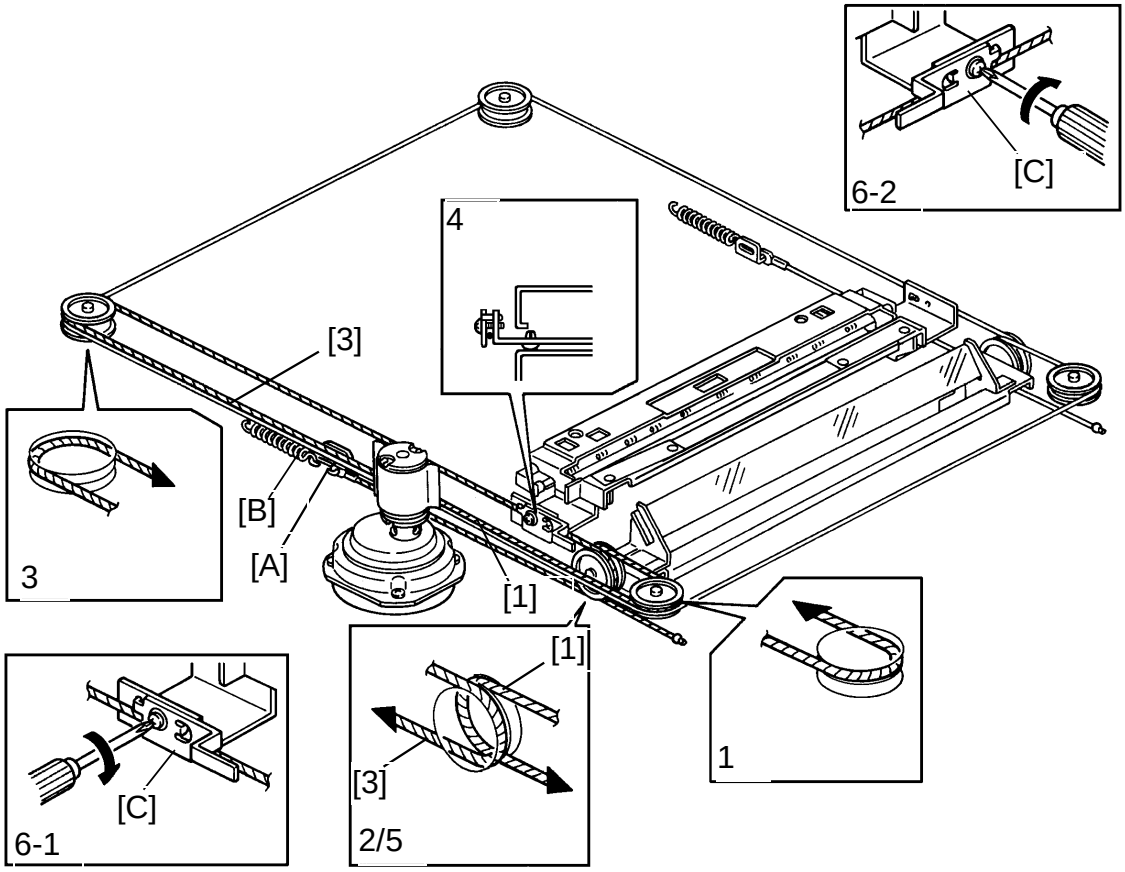
c) Wires are wound around all the grooves shown in the illustration (front view [E]).

11. Set the pulley on the drive shaft and tighten both Allen screws.

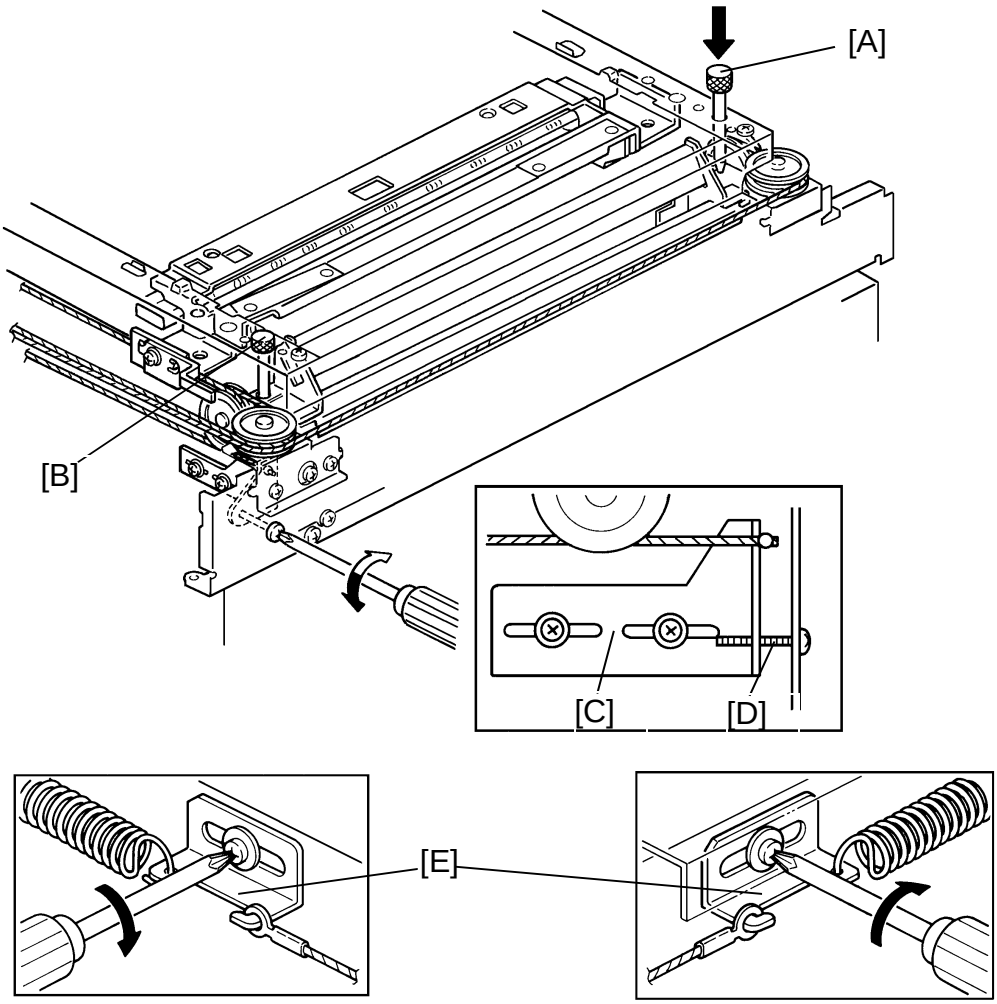
NOTE: Maintain 1 mm of clearance between the pulley and the bushing as shown in the above figure. Place the scale (1 mm thick) between the pulley and the bushing before tightening the Allen screws on the pulley.



12. Manually move the first and second scanners to home position.
13. Insert the four positioning pins [A] in the holes on the scanner guide rails to secure the first and second scanners.
14. Loosen the wire tension bracket fixing screw [B] and the wire tension adjusting screws [C].
15. Loosen the screw securing the front fixing plate [D]. Place wires [2] and [4] on the pulleys as shown.
16. Hook the silver wire [4] onto the fixing plate and hook the wire tension spring [E] onto the fixing plate and the frame projection.

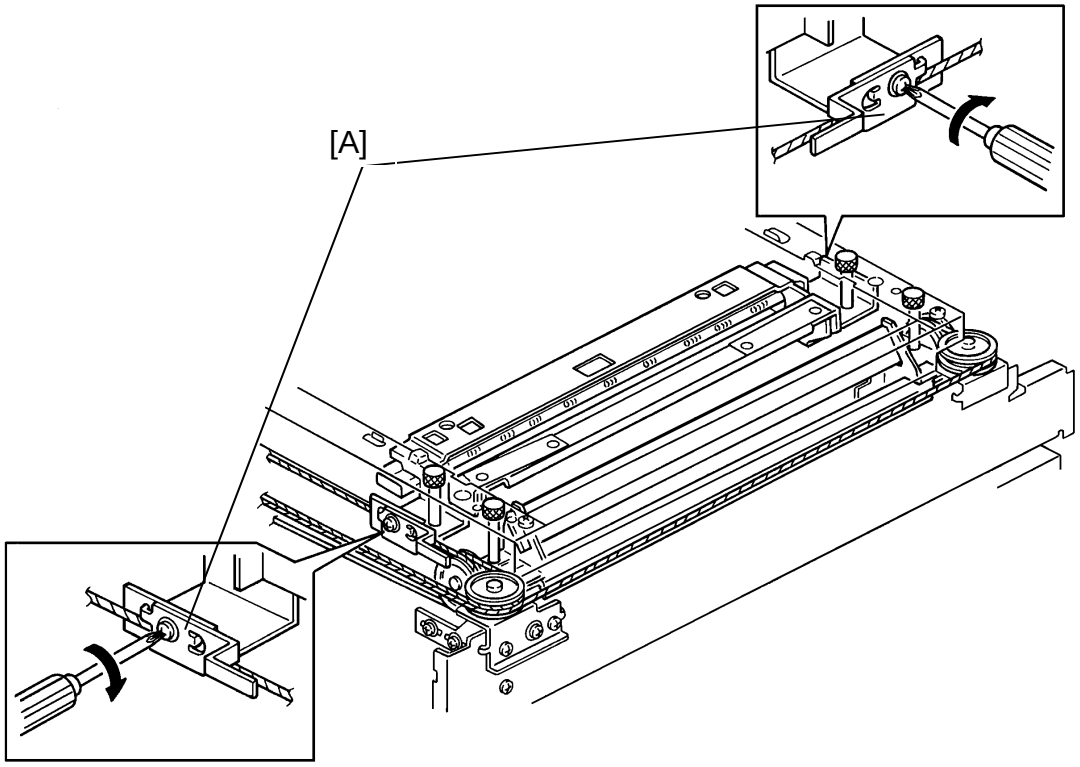


17. Attach blue wires [1 and 3] around the pulleys as shown.
18. Attach wire [3] to the wire fixing plate [A], then hook one end of tension spring [B] to the fixing plate and the other end to the frame projection.
19. Tighten the first scanner clamps [C] and remove the four positioning pins and the omega clamp.
20. Perform free run (turn DIP switch 101-1 ON) for 10 minutes and make sure that the scanners operate smoothly.



21. Adjust the tension in the second scanner wire.

(1) Insert positioning pin [A] in the hole at the front end of the second scanner.
(2) Loosely insert positioning pin [B] in the hole at the rear end of the second scanner.
(3) Loosen the two screws securing the wire tension bracket [C], then turn the 2nd scanner positioning screw [D] clockwise until the rear positioning pin drops and locks in position.
(4) Tighten the two screws securing the wire tension bracket [C].
(5) Make sure the positioning pin [B] slides in and out smoothly. If not, repeat step (3).
(6) Tighten the screws securing the front and rear wire fixing plates [E].



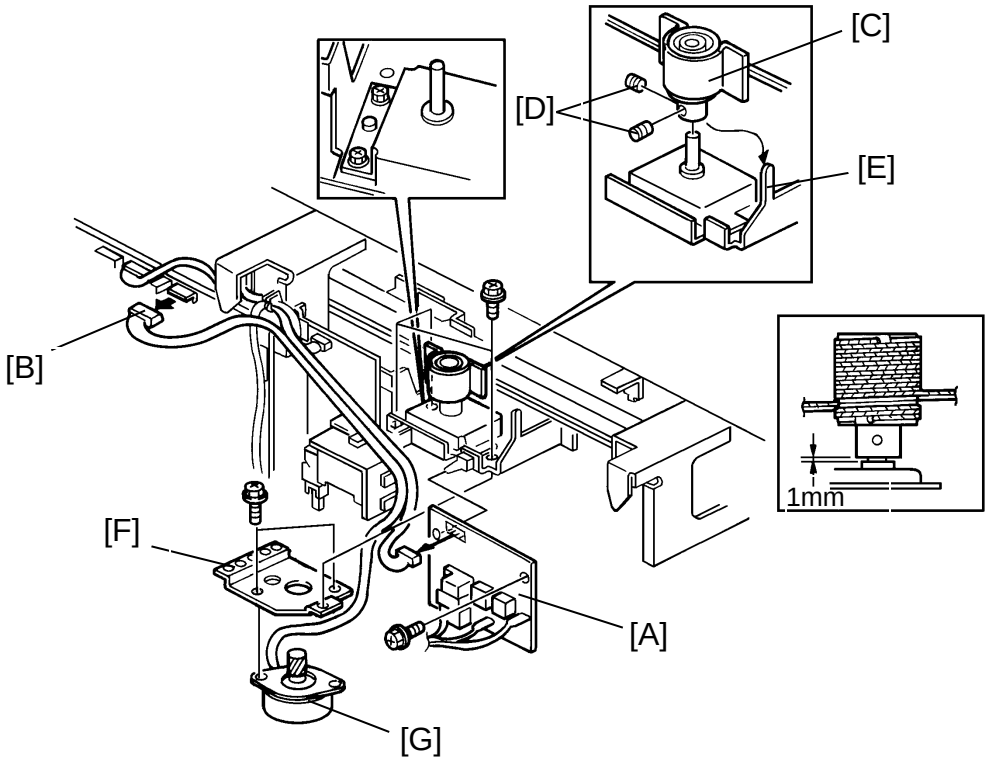
22. Adjust the first scanner wire clamps.

    (1) Loosen the front and rear first scanner wire clamps [A]
    (2) Insert the front and rear positioning pins (2).
    (3) Tighten the wire clamps.

23. Reassemble.

NOTE: Always adjust the first scanner wire clamps after adjusting the tension in the second scanner wire.

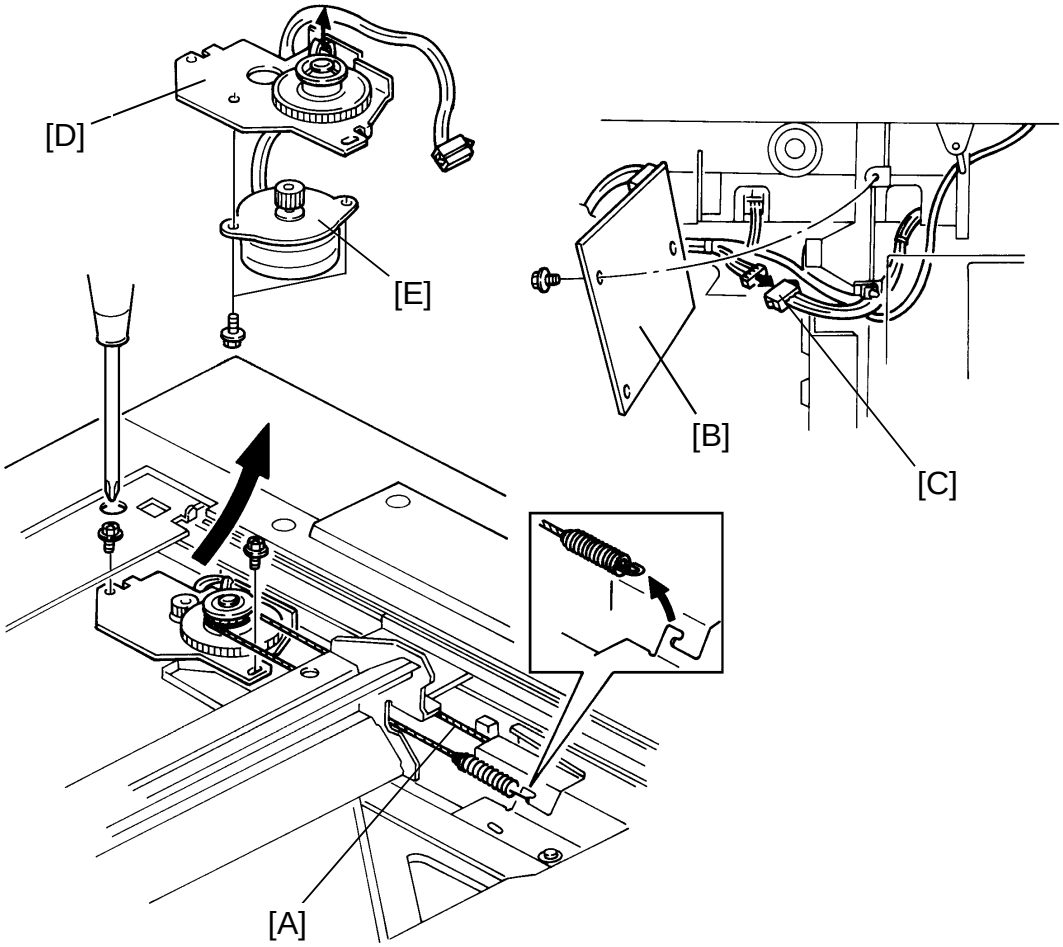
2.8 SCANNER MOTOR REPLACEMENT



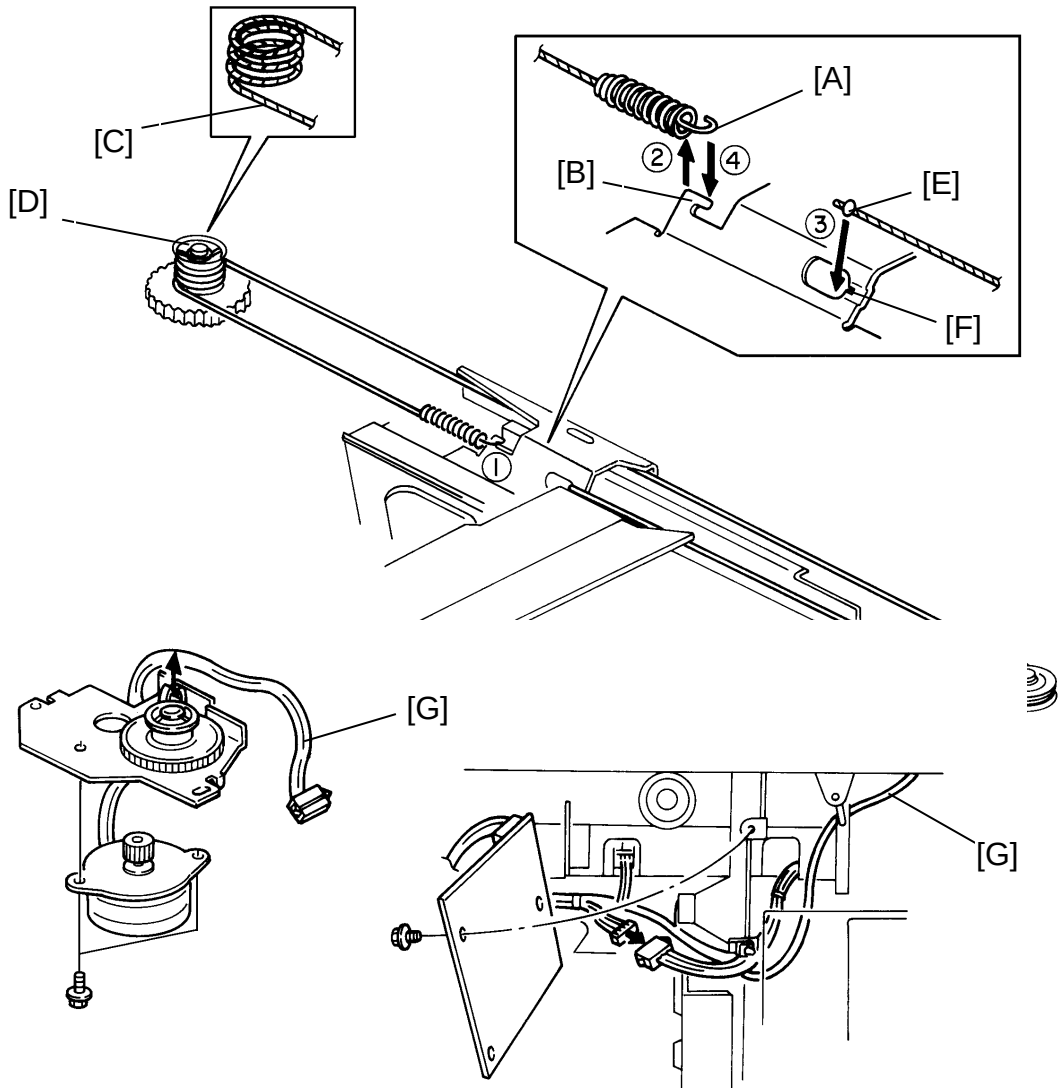
1. Turn off the main switch.
2. Remove the rear cover and the upper cover.
3. Remove the CC/G/B power pack [A] (2 locking supports, 1 screw, and 4 connectors).
4. Remove the 6P connector [B] from the main board and remove the scanner motor harness from the harness clamps.
5. Secure the scanner wire with the omega clamp [C] so that it does not come off the pulley. (Use tape if no clamp is available.)
6. Remove the two Allen screws [D] securing the scanner motor pulley and place it temporarily on bracket [E].
7. Remove the scanner motor bracket [F] (3 screws) and replace the scanner motor [G] (2 screws).

NOTE: Maintain 1mm of clearance between the pulley and the motor. Place the scale (1 mm thick) between the drive pulley and the motor bushing as shown in the above illustration and tighten the Allen screws.

2.9 LENS DRIVE MOTOR REPLACEMENT



1. Turn off the main switch.
2. Remove the exposure glass and the lens cover.
3. Move the scanner to the return side.
4. Remove the tension spring and the lens drive wire [A]. Remove the rear cover and the CC/G/B power pack [B] (2 locking supports and 1 screw).
5. Remove the lens drive motor 6P connector [C].
6. Remove the lens drive motor bracket [D] (2 screws).
7. Remove the motor [E] from the bracket (2 screws), and replace the motor.
8. Reassemble.



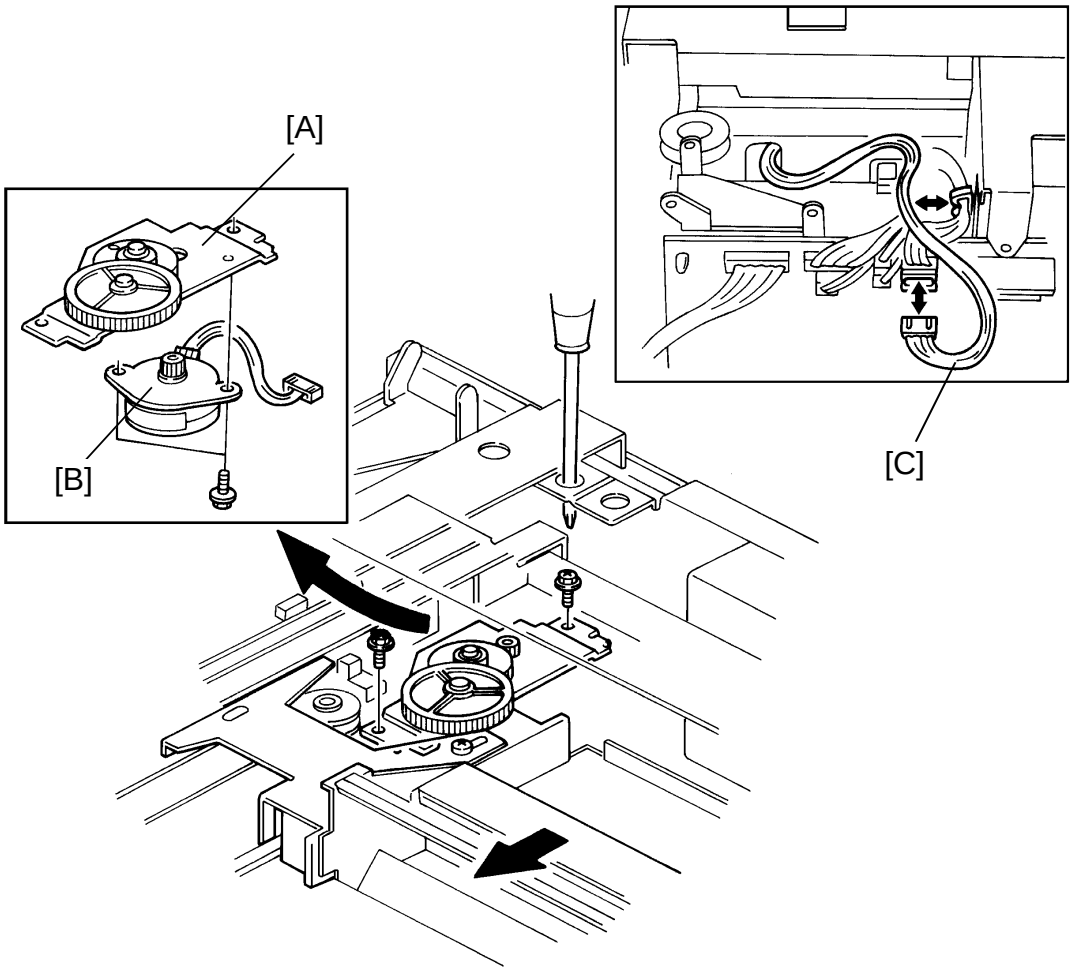
- Lens Drive Wire Installation -

1. Hook the spring [A] to the sensor actuator bracket [B].
2. Wind the lens drive wire [C] three and half times around the pulley [D].
3. Unhook the spring [A] and place the bead [E] at the other end of the wire in slot [F] on the sensor actuator bracket.
4. Reattach the spring to the bracket.

NOTE: a) Rotate the lens drive pulley and make sure that the scanner drive wire moves smoothly.

b) Position the motor harness [G] as shown when installing a new motor.

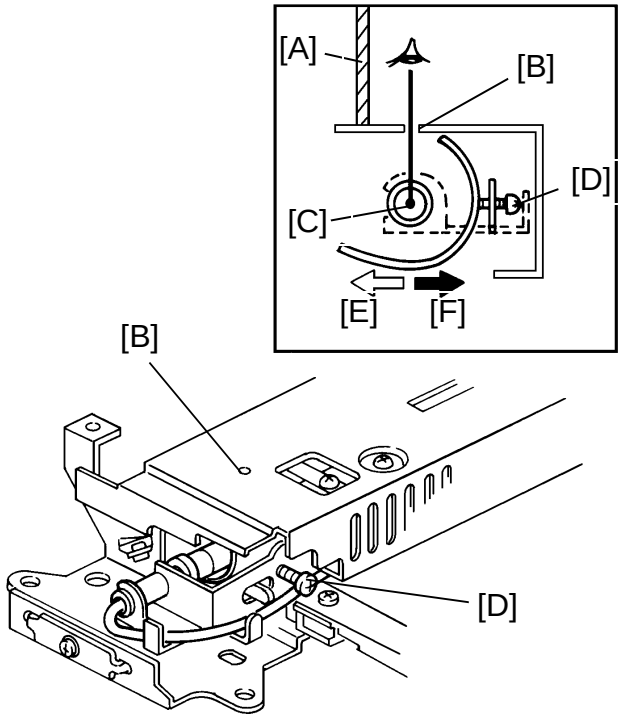
2.10 4TH/5TH MIRROR ASSEMBLY DRIVE MOTOR REPLACEMENT



1. Turn off the main switch.
2. Remove the exposure glass, upper cover, lens cover, and rear cover.
3. Remove the main board.
4. Move the 4th/5th mirror assembly to the left (viewed from the front).
5. Remove the motor bracket [A] (2 screws).
6. Separate the 3rd scanner drive motor [B] from the bracket (2 screws) and replace it.

NOTE: Position the motor harness [C] as shown when installing a new motor.

2.11 EXPOSURE LAMP POSITION ADJUSTMENT (HORIZONTAL DIRECTION)



1. Turn off the main switch.
2. Remove the exposure glass. (See Exposure Glass Removal.)
3. Move the first scanner to the cutout.
4. Position a scale [A] next to the sight hole [B] in the reflector cover to form a right angle for viewing alignment as shown.
5. Look at the lamp filament [C] through the sight hole in parallel with the scale. The filament should be directly beneath the sight hole.

NOTE: If necessary, use a penlight to illuminate the exposure lamp.

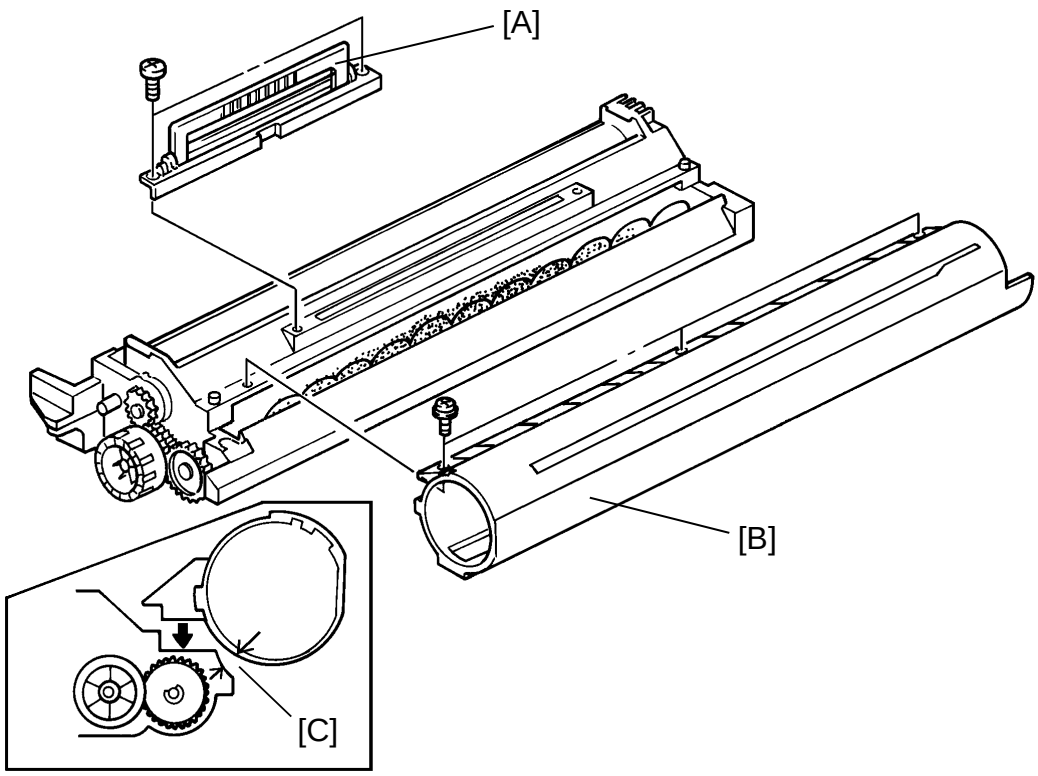
6. Turn screw [D] to adjust the position of the filament.

   Counterclockwise: Filament moves to the left (E direction).

   Clockwise: Filament moves to the right (F direction).

3. DEVELOPMENT AND TONER SUPPLY

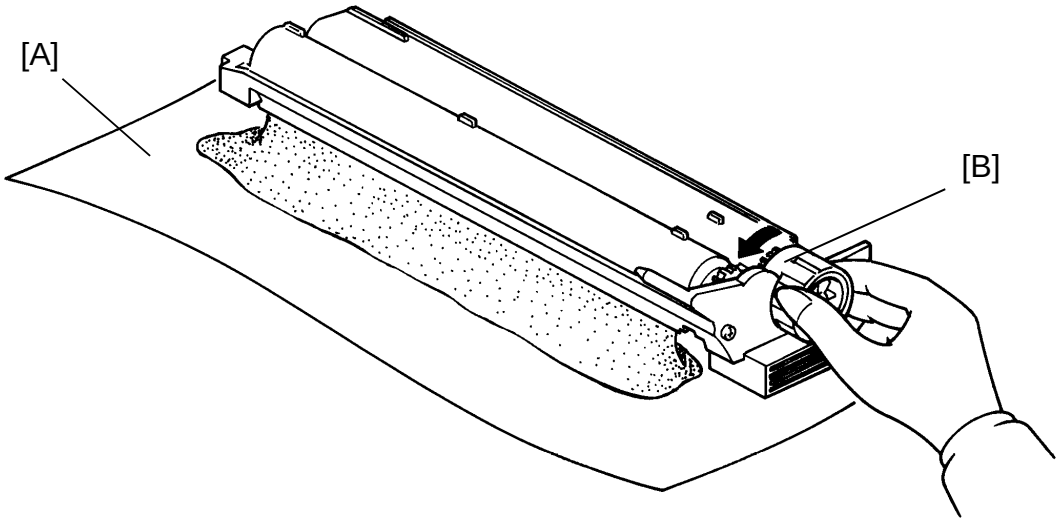
3.1 TONER TANK REMOVAL



1. Take out the development unit.
2. Remove the filter bracket [A] (2 screws).
3. Remove the toner supply unit [B] (3 screws).

NOTE: Make sure that there is no gap [C] between the toner supply unit and the development unit. (See illustration.)

3.2 DEVELOPER REPLACEMENT

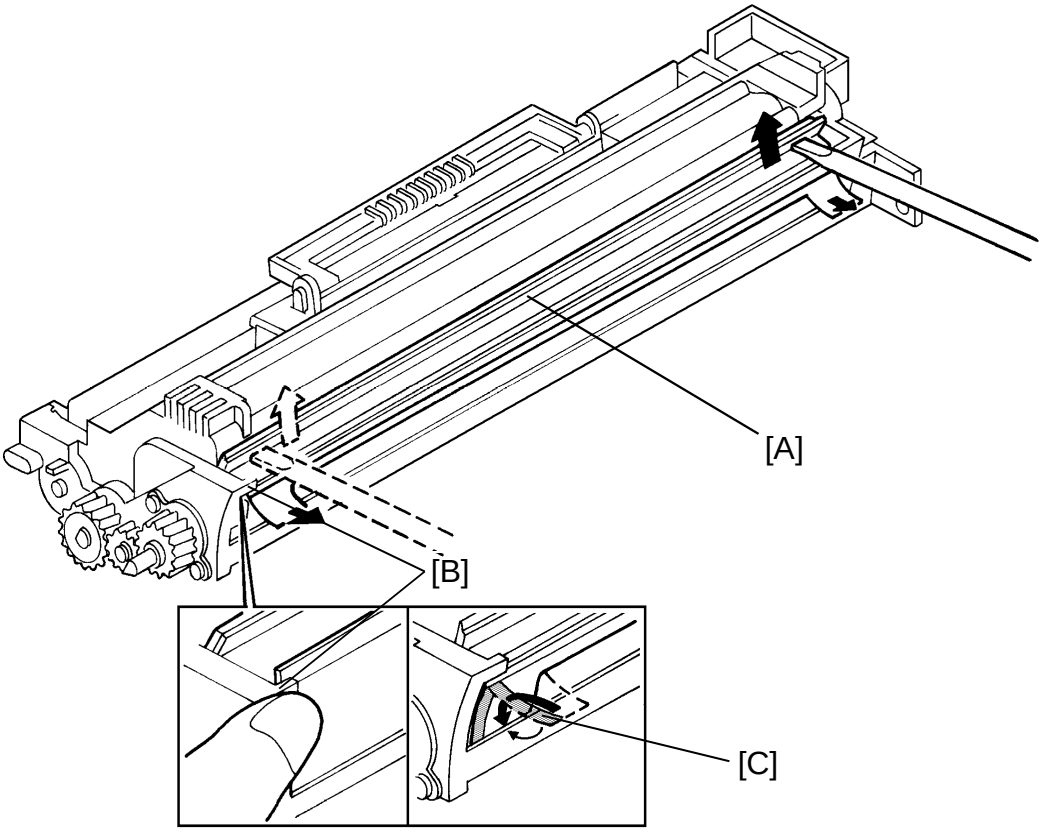


1. Take out the development unit.
2. Set the development unit on a large sheet of paper [A].
3. Remove the toner supply unit (3 screws). (See Toner Supply Unit Removal.)
4. Turn the paddle roller knob [B] counterclockwise to empty developer onto the paper.

   NOTE: Dispose of the used toner according to local regulations.
5. Make sure that no developer remains on the development roller or in the development unit.
6. Pour one pack of developer into the development unit while turning the paddle roller knob.
7. Reinstall the toner tank and set the development unit in the machine.
8. Confirm using SP mode #54 that Vsg is 4 ± 0.2 volts .
   If not, adjust Vsg. (See ID Sensor Adjustment.)
9. Perform initial setting for new black or color developer using the following SP modes:

Black	Color
SP Mode #65	SP Mode #10

3.3 INLET SEAL REMOVAL



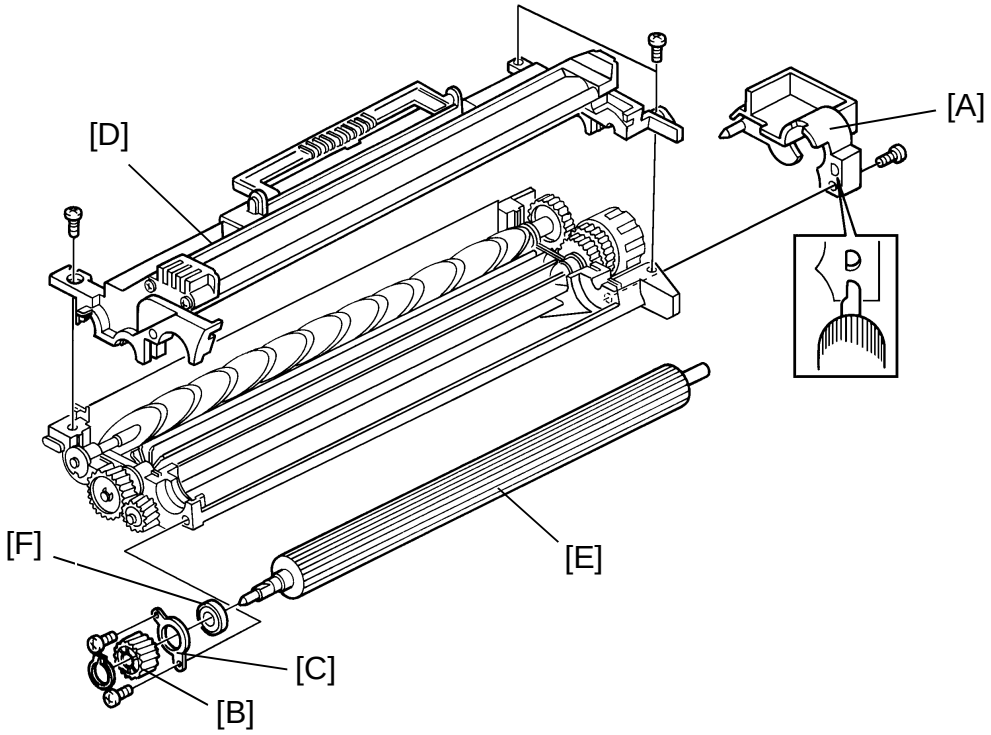
1. Take out the development unit.
2. Remove the inlet seal plate [A] by working a small blade screwdriver along the edge of the plate while pressing the stoppers [B] with one finger as shown.

NOTE: a) Be careful not to damage the stoppers [B] when removing the inlet seal plate.

b) The inlet seal plate must be replaced (i.e. a new plate must be installed) when it is removed to adjust the doctor gap or to replace the development roller.

c) To install a new inlet seal plate, remove the covering from the 2-sided tape [C] and affix the inlet seal [D] to the development unit lower casing. Tuck both ends of the seal inside the lower casing as shown.

3.4 DEVELOPMENT ROLLER REPLACEMENT

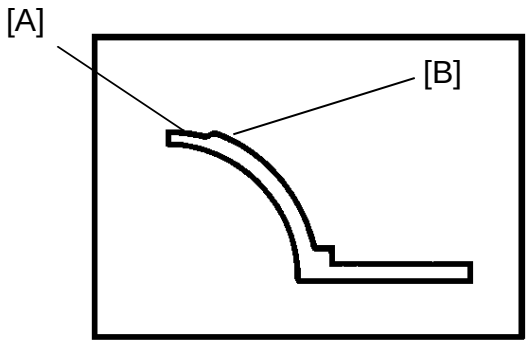


1. Take out the development roller and remove the toner tank. (See Toner Tank Removal.)
2. Empty the developer from the development unit onto a clean sheet of paper. Keep the developer clean for later use; do not allow it to be contaminated by foreign material.
3. Remove the development roller positioning bracket [A] (2 screws).
4. Remove the inlet seal plate. (See Inlet Seal Plate Removal.)
5. Remove the development roller gear [B] (1 C-ring).
6. Remove the bearing retainer [C] (2 screws).
7. Remove the upper case [D] (3 screws).
8. Remove the development roller [E] with bearing [F].
9. Replace the development roller.

NOTE: a) When replacing the development roller, use a blower brush to remove any carrier from the bearing, inlet seal plate, etc.

b) After reassembling the development unit, make sure that the DG gap is within 0.6 ± 0.07 mm. (See Doctor Gap Adjustment.)

3.5 DOCTOR GAP ADJUSTMENT



NOTE: a) Use a doctor gap gauge (P/N #A0489500) to measure the doctor gap. This gauge has a "GO" [A] and a "NO GO" section [B].

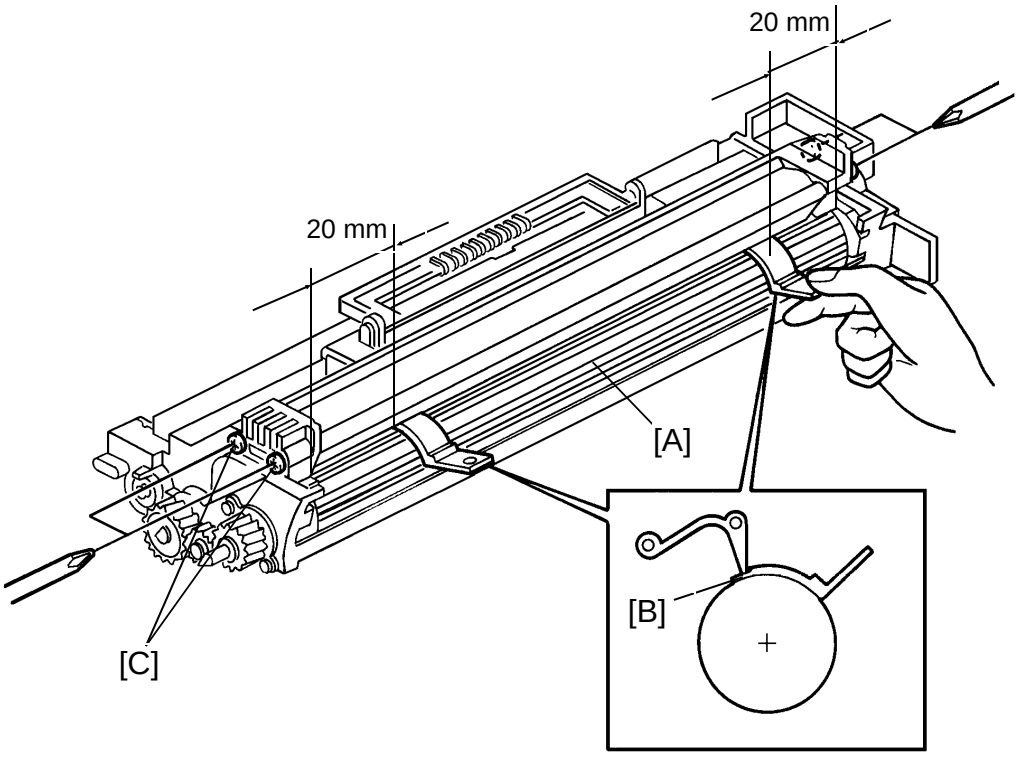
b) Doctor gap adjustment is required whenever the development unit is disassembled or the doctor plate is replaced.

CAUTION: Clean the development roller before starting the adjustment procedure. This prevents surface damage to the roller and ensures an accurate adjustment.

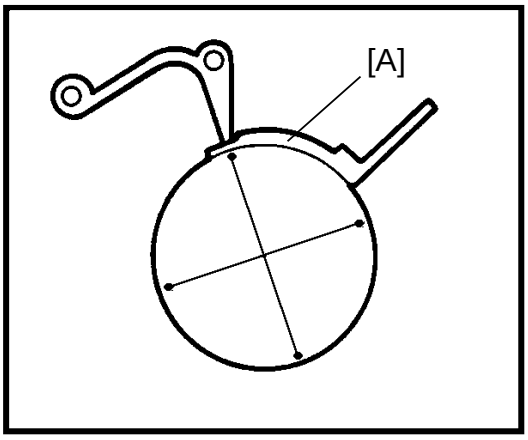
ADJUSTMENT STANDARD: 0.6 ± 0.07 mm (0.024" ± 0.003")

- Adjustment Procedure -

1. Take out the development unit and remove the toner supply unit. (See Toner Supply Unit Removal.)
2. Remove the developer.
3. Remove the development roller positioning bracket and the inlet seal plate (See Inlet Seal Plate Removal.)



4. Clean all developer from the development roller [A] with a vacuum cleaner. Turn the roller to make sure that it is free of developer.
5. Loosen the doctor plate (4 screws).
6. Insert the"GO" gauge [B] in the doctor gap 20mm from the rear side of the development roller as shown.
7. Press down the doctor plate, and tighten the rear doctor plate screws [C].
8. Repeat the adjustment procedure at the front side of the development roller.
9. Check the doctor gap (procedure on next page).



- Confirmation Procedure -

1. Carefully follow the procedure given here to correctly measure the doctor gap.

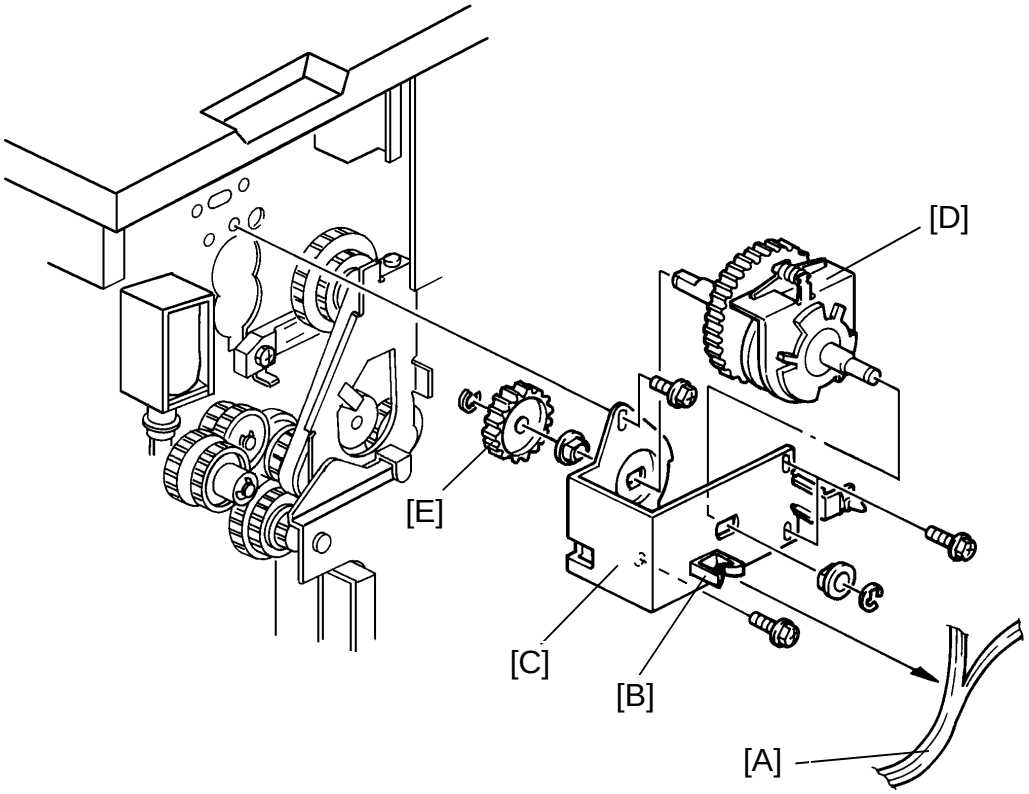
   (1) Insert the gauge [A] into the doctor gap 20mm from the front end of the development roller.

   (2) Check the doctor gap at three other points 20mm from the front end of the development roller, turning the roller 90° each time.

   (3) Repeat steps (1), (2), and (3) for the rear side of the development roller.

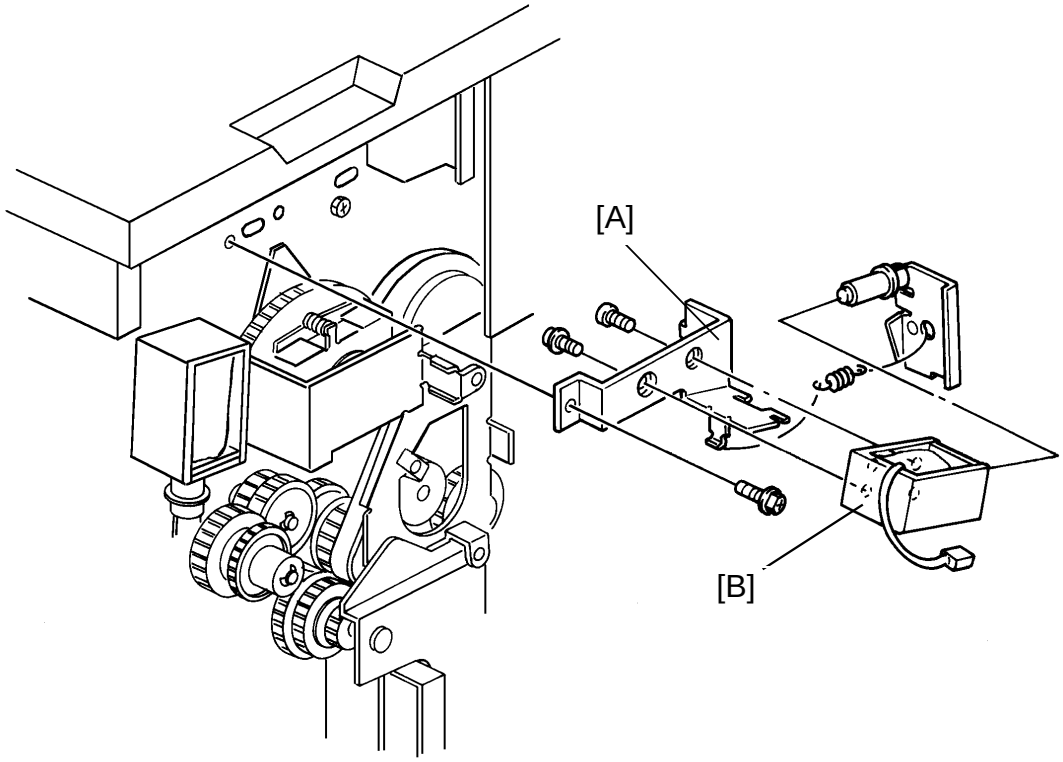
2. When the gap is 0.53 - 0.67 mm at three points on each side, the gap has been adjusted properly.
3. If the gap is out of specification at more than one point on either side, repeat the adjustment procedure.

3.6 TONER SUPPLY CLUTCH SOLENOID REPLACEMENT



1. Turn off the main switch.
2. Remove the rear cover and main board (all connectors and 5 locking supports).
3. Remove the color switch harness [A] from the clamp [B].
4. Remove the toner supply clutch solenoid bracket [C] (4 screws).
5. Replace the clutch solenoid [D] (2 E-rings, bushings, and 1 gear[E]).

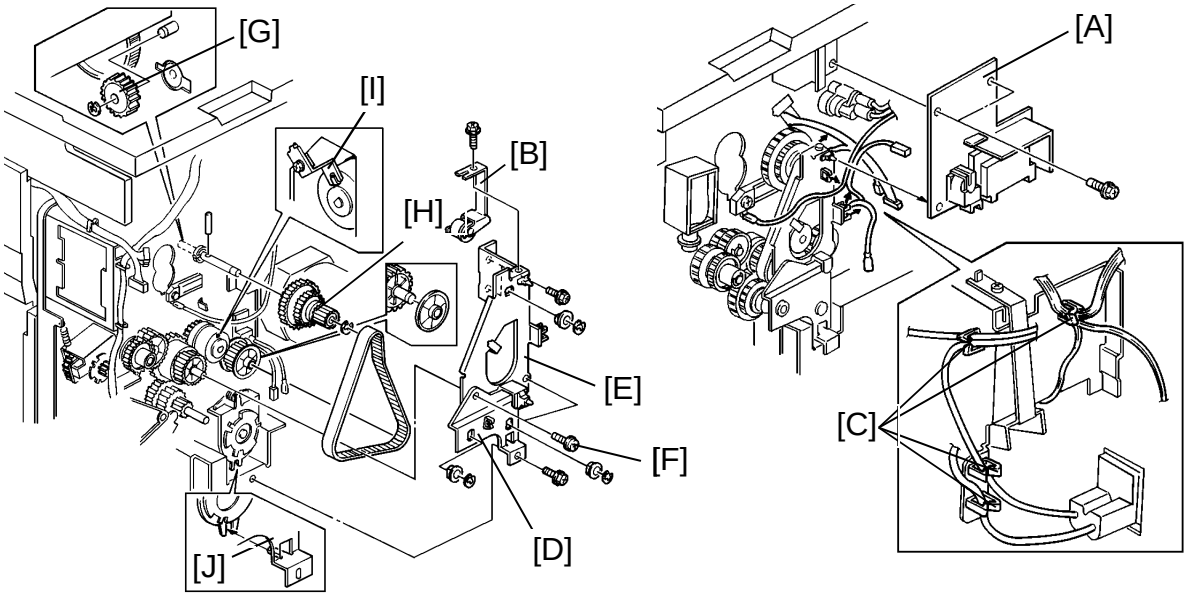
3.7 DEVELOPMENT DRIVE CLUTCH SOLENOID REPLACEMENT



1. Turn off the main switch.
2. Remove the rear cover and main board (all connectors and 5 locking supports).
3. Remove the clutch solenoid bracket [A] (1 screw).
4. Replace the solenoid [B] (2 screws).

NOTE: Reinstall the solenoid on the bracket [A] so that the harness is positioned on the upper side as shown.

3.8 DEVELOPMENT DRIVE CLUTCH REPLACEMENT



1. Remove the following parts:

   - Front cover
   - Cleaning unit
   - Drum unit
   - Main board
   - Development drive clutch solenoid
   - Development unit
   - Charge corona unit
   - Rear cover
   - Toner supply clutch solenoid

2. Remove the TC&SC power pack [A] (2 locking supports and screws).
3. Remove the timing belt tightener [B] (1 screw).
4. Remove the harnesses from the clamps [C] on the frames as shown.
5. Remove the big and small frames [D and E] (3 E-rings, bushings, and 6 screws).

   Screws : 4 tapping screws and 2 screws with washer [F].

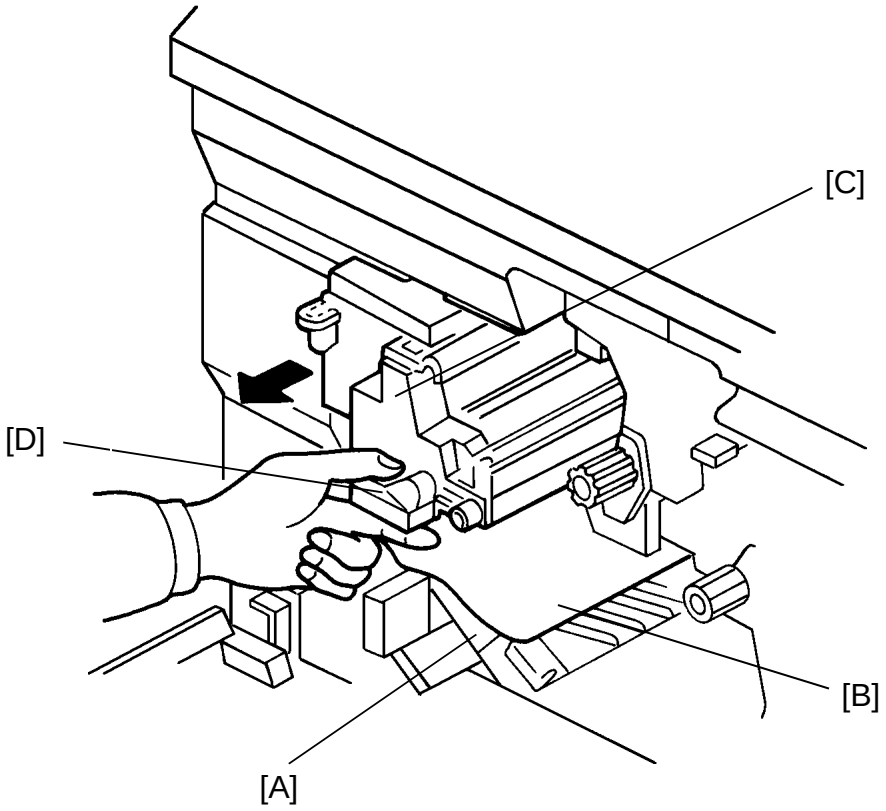
6. Remove the development drive gear [G] (1 E-ring) from the front side.
7. Replace the drive clutch [H] (1 E-ing and parallel pin).

NOTE: When reassembling, make sure of the following:

a) The timing belt fits correctly onto the sprockets.
b) Stopper [I] locks the registration clutch.
c) Stopper [J] locks the 2nd feed roller clutch solenoid.
d) The harnesses do not pass between the frames.

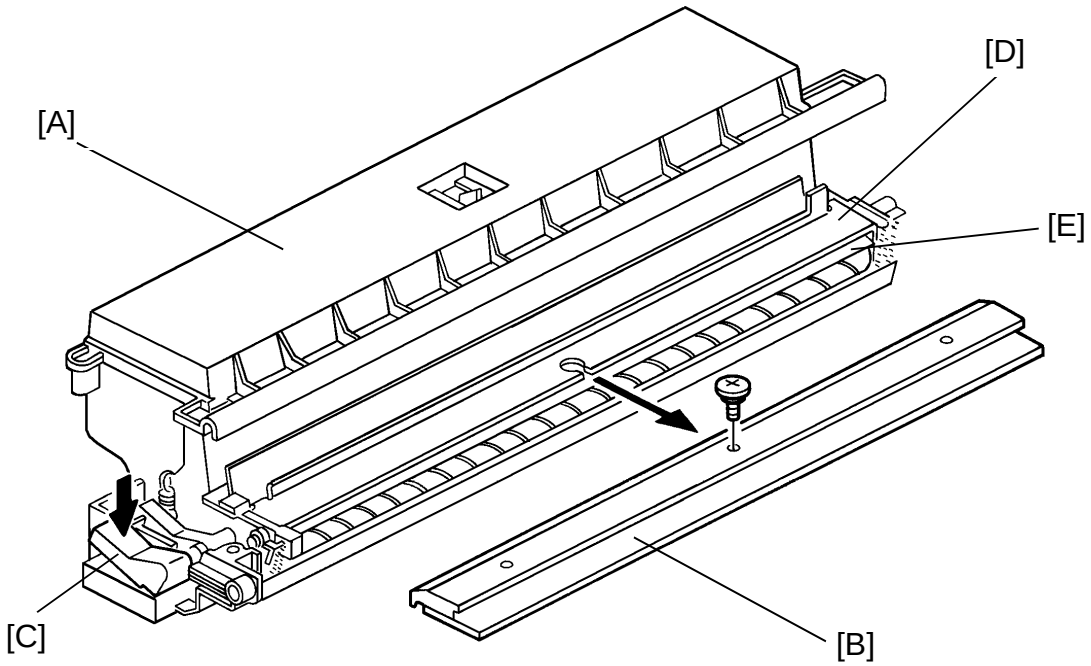
4. CLEANING

4.1 CLEANING UNIT REMOVAL



1. Open the front cover.
2. Lower the transport unit [A].
3. Place a sheet of paper [B] underneath the cleaning unit [C].
4. While holding down the cleaning blade release lever [D], remove the cleaning unit.

4.2 CLEANING BLADE REPLACEMENT

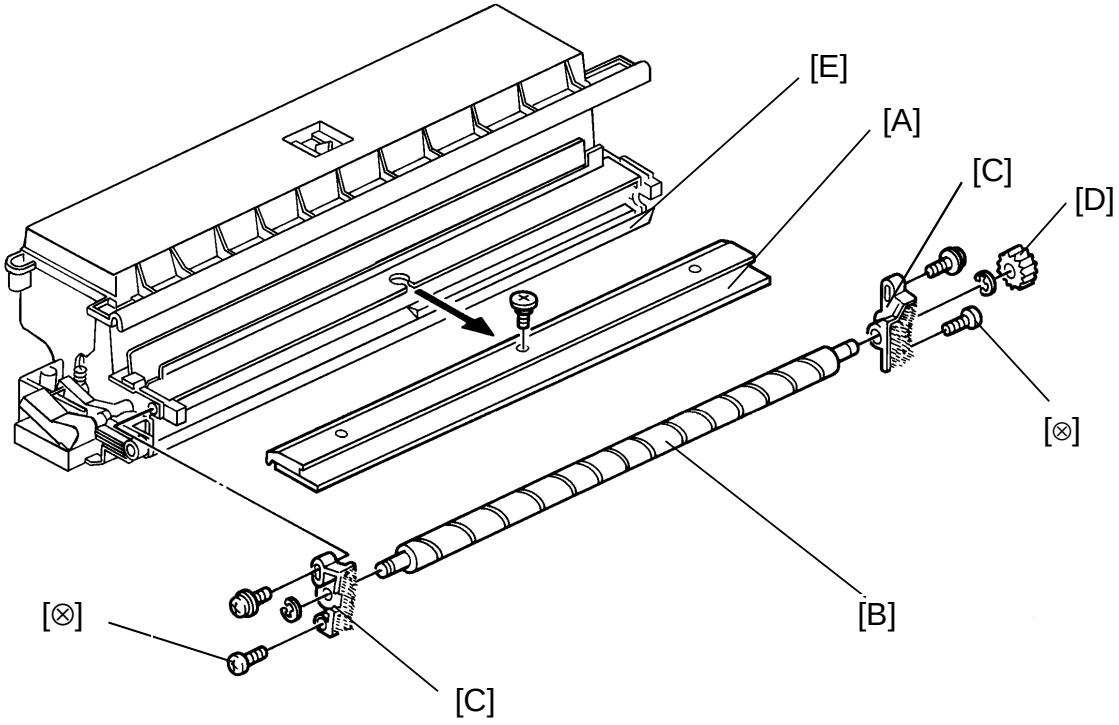


1. Remove the cleaning unit [A]. (See Cleaning Unit Removal.)
2. Remove the cleaning blade [B] (1 screw).
3. While holding down the cleaning blade release lever [C], install the new cleaning blade between the blade bracket [D] and the blade scraper [E] (collar screw).

NOTE: a) Do not touch the edge of a new cleaning blade, as it is damaged easily.

b) After installing a new cleaning blade, make sure it swivels.

4.3 CLEANING BRUSH REPLACEMENT



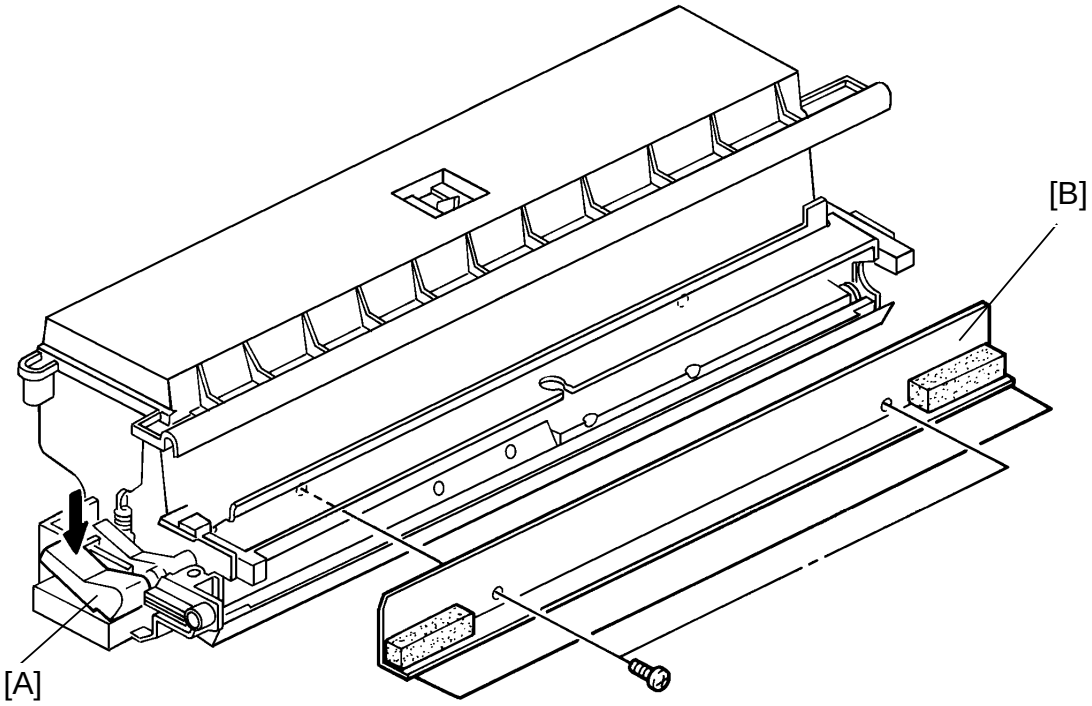
1. Remove the cleaning blade [A]. (See Cleaning Blade Replacement.)
2. Remove the cleaning brush bracket screws (4); then, remove the cleaning brush [B] together with the cleaning side brackets [C] and gear [D].
3. Remove the gear and the two E-rings, and replace the cleaning brush.

NOTE: a) Do not touch the cleaning brush surface. Handle only the shaft-ends.

b) Do not bend or damage the entrance seal [E].

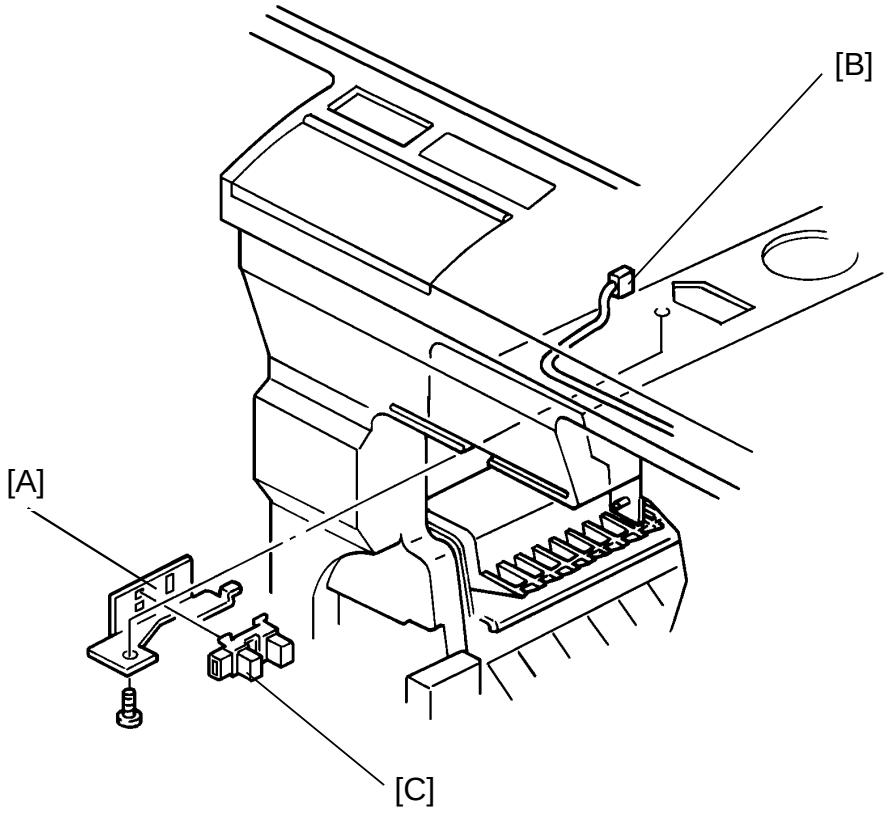
c) These screws [⊗] are tapping screws. Do not tighten them too much as this will strip the resin threads.

4.4 BLADE SCRAPER REPLACEMENT



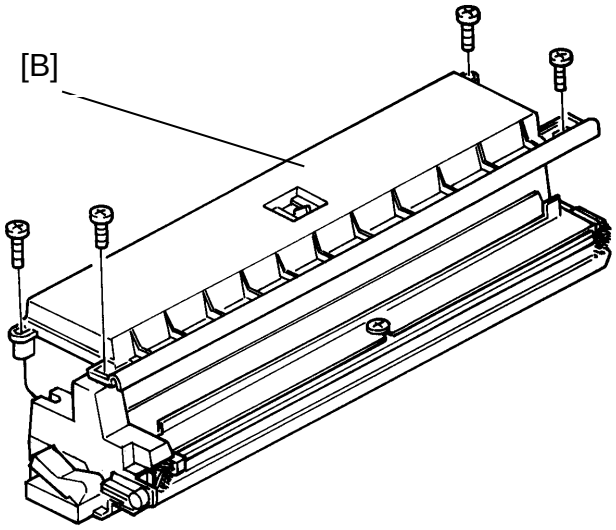
1. Remove the cleaning blade and brush. (See Cleaning Blade and Brush Replacement.)
2. While holding down the cleaning blade release lever [A], remove the blade scraper [B] (2 screws).

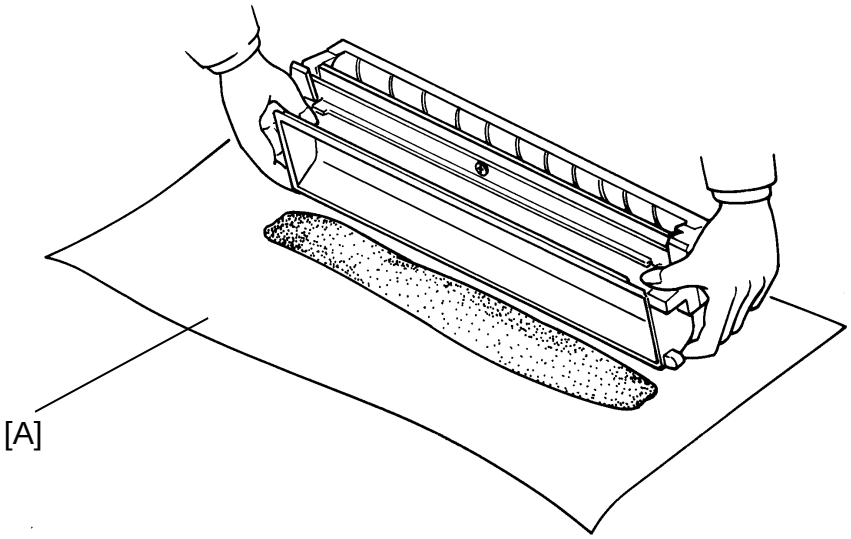
4.5 TONER OVERFLOW SENSOR REPLACEMENT



1. Remove the cleaning unit.
2. Lower the transport unit.
3. Remove the toner overflow sensor bracket [A] from the duct bracket (1 screw).
4. Disconnect the connector [B] and remove the toner overflow sensor [C] from the bracket (1 screw).

4.6 USED TONER COLLECTION

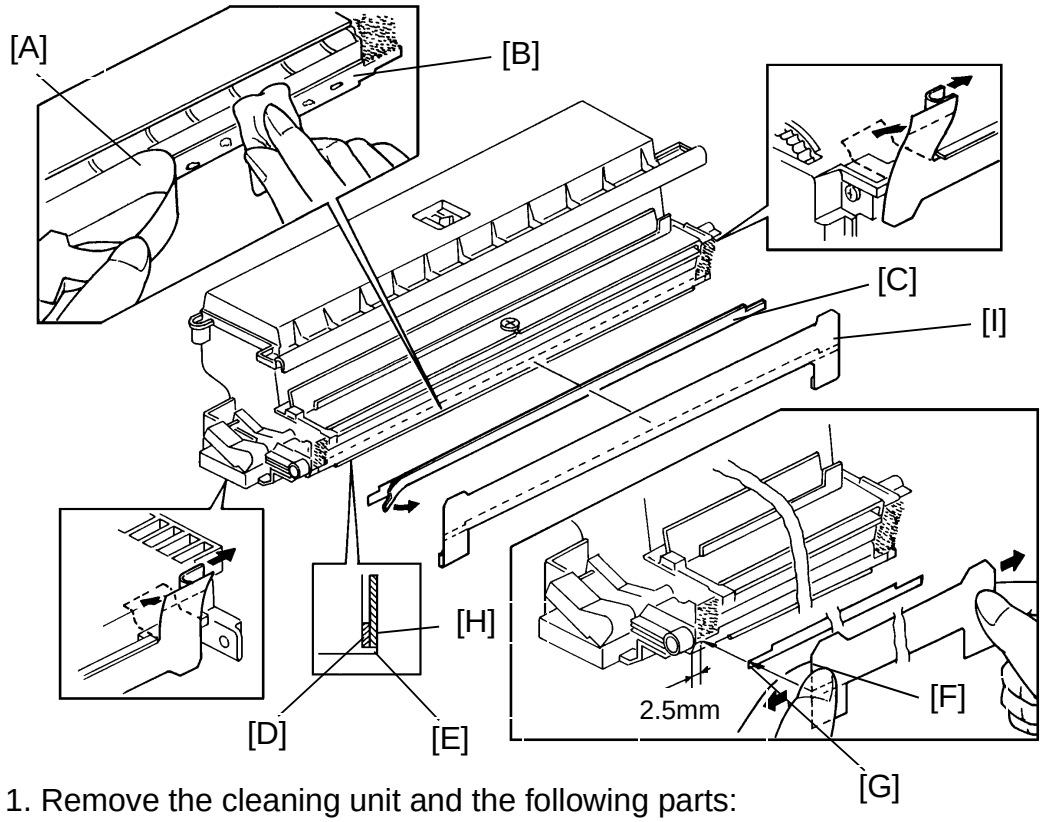




1. Remove the cleaning unit.
2. Set the cleaning unit on a large sheet of paper [A].
3. Remove the toner collection cover [B] (4 screws).
4. Pour the used toner slowly onto the paper sheet so that the toner does not scatter.
5. Place the paper sheet with the toner into a vinyl bag.

NOTE: Dispose according to local regulations.

4.7 ENTRANCE SEAL REPLACEMENT



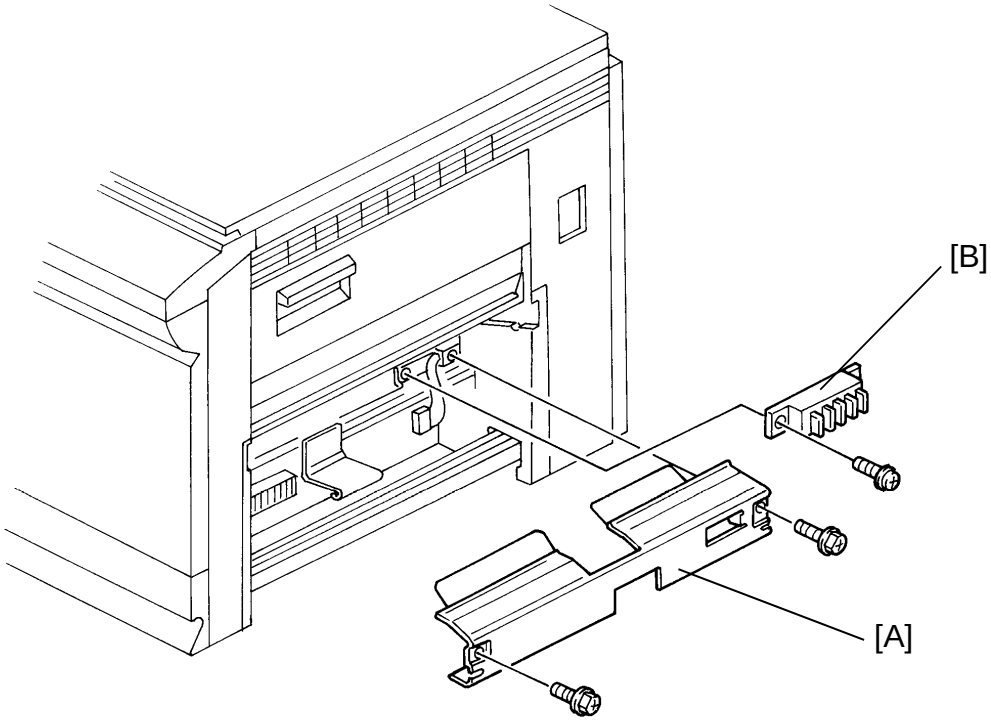
1. Remove the cleaning unit and the following parts:
   - Cleaning Blade
   - Cleaning Brush
2. Remove the used toner. (See Used Toner Collection.)
3. Clean the cleaning unit with a vaccum cleaner.
4. Remove the entrance seal [A] together with the strip of 2-sided tape securing it to the lower casing.
5. Clean the lower casing [B] with alcohol; make sure that no tape remains on the casing surface.
6. Place a new strip of 2-sided tape [C] on the lower casing surface. The lower edge [D] of the tape must be flush with the edge [E] of the projection as shown in the illustration.
7. Place the new entrance seal on the 2-sided tape. Extend the seal so that both edges [F] align with the edges [G] of the tape.

NOTE: a) The lower edge [H] of the entrance seal must be aligned with the edge [E] of the projection on the lower casing.

b) Make sure that there are no waves in the upper edge [I] of the entrance seal.

5. PAPER FEED

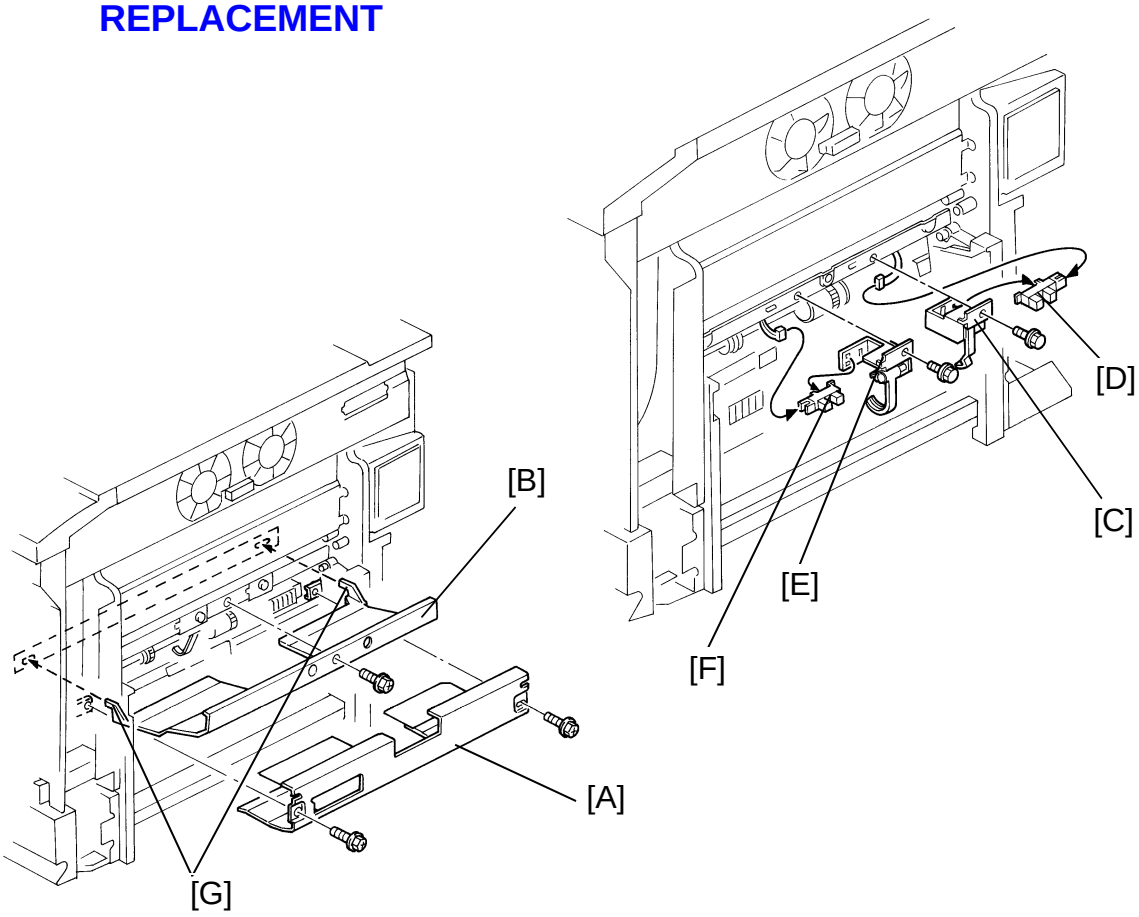
5.1 PAPER SIZE SWITCH REPLACEMENT



1. Turn off the main switch.
2. Remove the paper feed lower guide plate [A] (2 screws).
3. Remove the size switch [B] from the paper feed station (1 screw).
4. Pull the size switch out slightly and unhook the connector. Remove the size switch.

NOTE: After connecting the new switch to the connector, take up slack in the switch harness by pulling on it from the rear side of the copier.

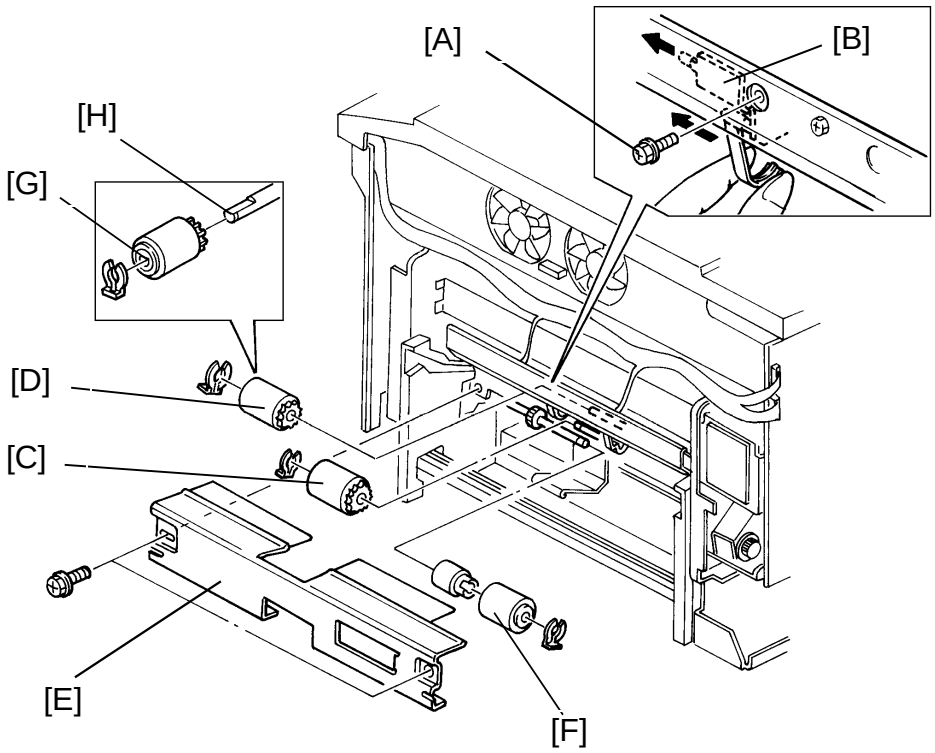
5.2 1ST PAPER END SENSOR AND PAPER LIFT SENSOR REPLACEMENT



1. Turn off the main switch.
2. Remove the manual feed table. (See Manual Feed Table Removal.)
3. Remove the paper feed lower guide bracket [A] (2 screws).
4. Remove the paper feed upper guide bracket [B] (1 screw).
5. Remove the 1st paper end sensor bracket [C] (1 screw).
6. Replace the 1st paper end sensor [D] (1 connector).
7. Remove the paper lift sensor bracket [E] (1 screw).
8. Replace the paper lift sensor [F] (1 connector).

NOTE: When installing the paper feed upper guide plate, make sure that the hooks [G] fit into the holes as shown.

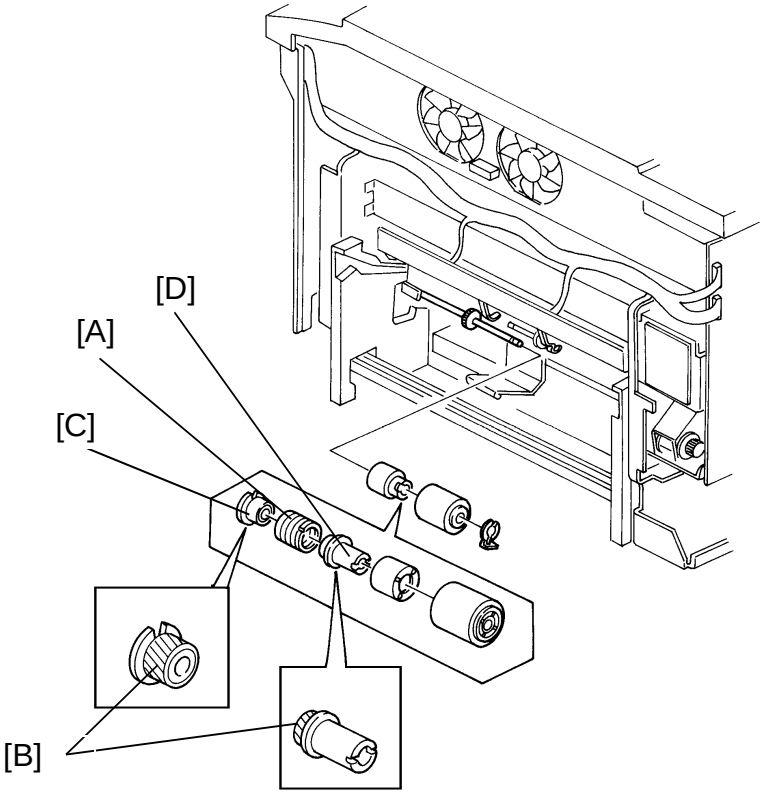
5.3 1ST FEED ROLLER, PICK-UP ROLLER, AND REVERSE ROLLER REPLACEMENT



1. Turn off the main switch.
2. Open the manual feed table.
3. Remove the screw [A] securing the paper lift sensor bracket [B].
4. Close the manual feed table.
5. Slide the sensor bracket in the direction of the arrow.
6. Replace the pick-up roller [C] (1 small snap-ring).
7. Replace the feed roller [D] (1 snap-ring).
8. Remove the paper feed lower guide bracket [E] (2 screws).
9. Replace the reverse roller [F] (1 small snap-ring).

NOTE: a) Snap-rings come in two sizes; the larger of the two is used on the feed roller.

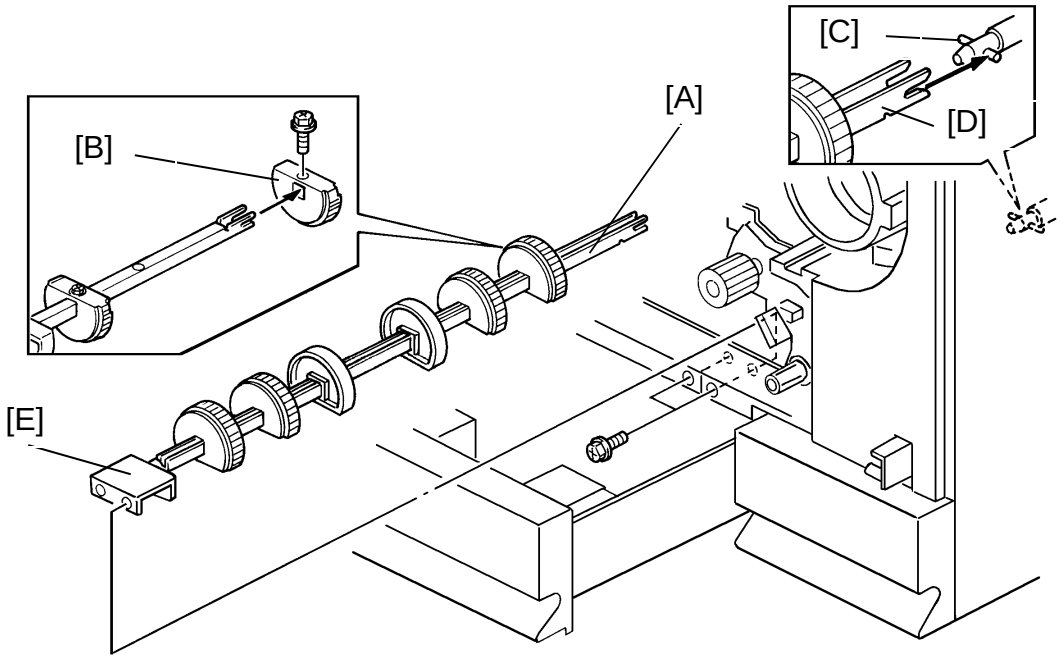
b) Flat faces [G] and [H] of the feed roller and shaft must be aligned.



- To install -

1. Clean the rollers with a damp cloth.
2. Clean the clutch spring [A] of the reverse roller.
3. Lubricate the surface [B] of the output hub [C] and input hub [D] with Mobil Temp. 78.

5.4 2ND PAPER FEED ROLLER REPLACEMENT



1. Turn off the main switch.
2. Open and remove the front cover.
3. Pull out the paper tray or the duplex tray.
4. Remove the feed roller assembly [A] (2 screws).
5. Replace the feed roller [B] (1 screw each).

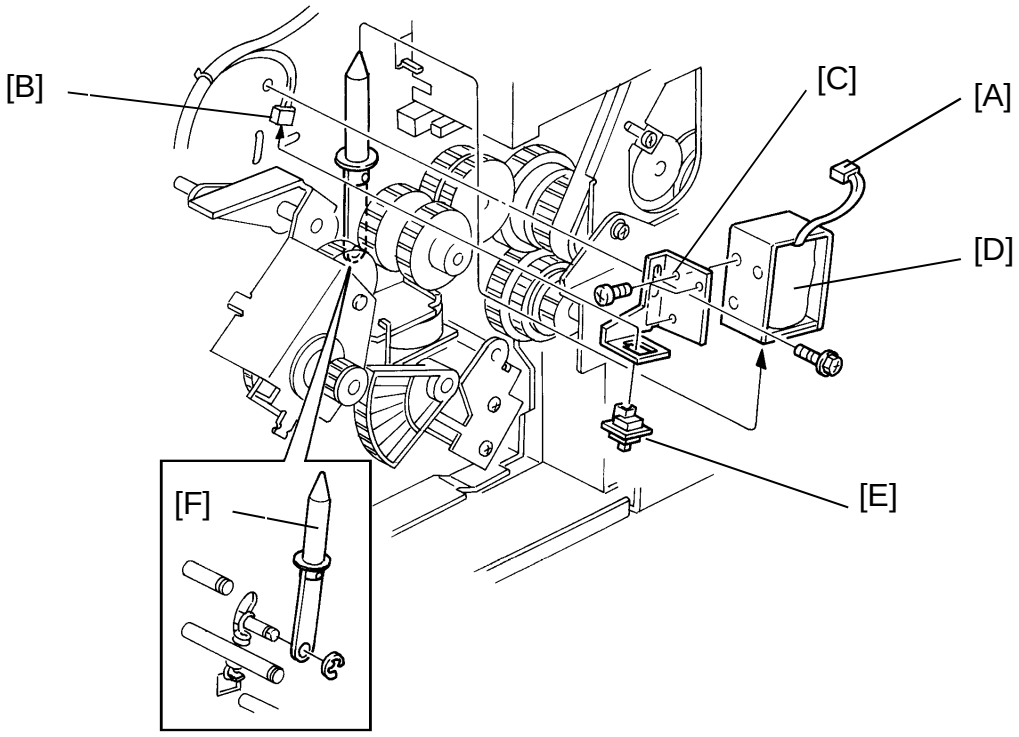
NOTE: When reinstalling the feed roller assembly, make sure of the following:

a) The feed rollers face up as shown.

b) The pins [C] on the end of the drive shaft fit into the slots [D] on the end of the feed roller shaft.

c) Surface [E] of the bracket faces up.

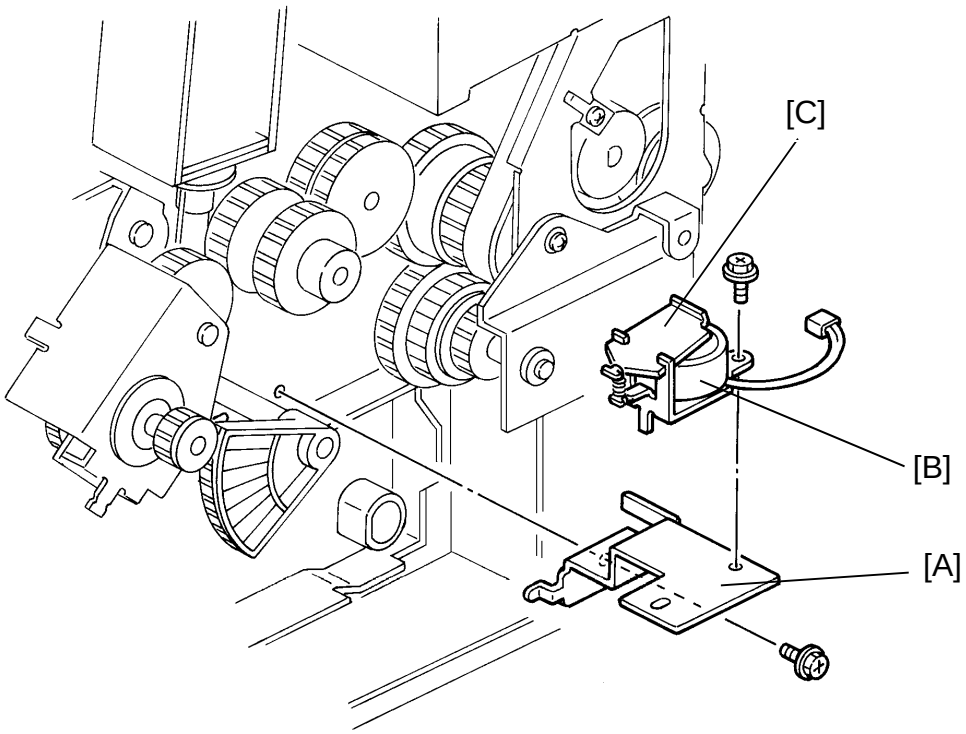
5.5 PICK-UP ROLLER RELEASE SOLENOID AND MANUAL FEED TABLE SWITCH REPLACEMENT



1. Turn off the main switch.
2. Remove the rear cover.
3. Remove the main board (5 locking supports and all connectors).
4. Disconnect the connectors [A and B] of the solenoid and switch.
5. Remove the solenoid bracket [C] (1 screw).
6. Replace the solenoid [D] (3 screws) or switch [E].

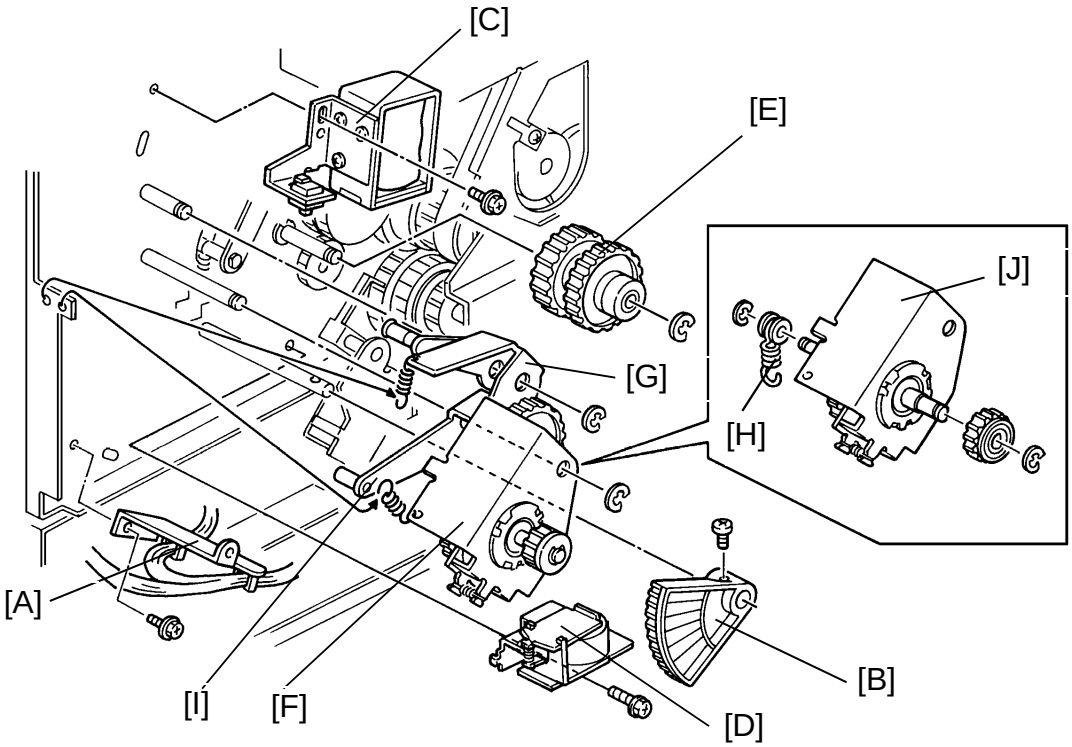
NOTE: Before replacing the plunger [F] (1 E-ring), first remove the paper lift clutch solenoid assembly. (See Paper Lift Clutch Solenoid Assembly Replacement.)

5.6 1ST FEED ROLLER SPRING CLUTCH SOLENOID REPLACEMENT

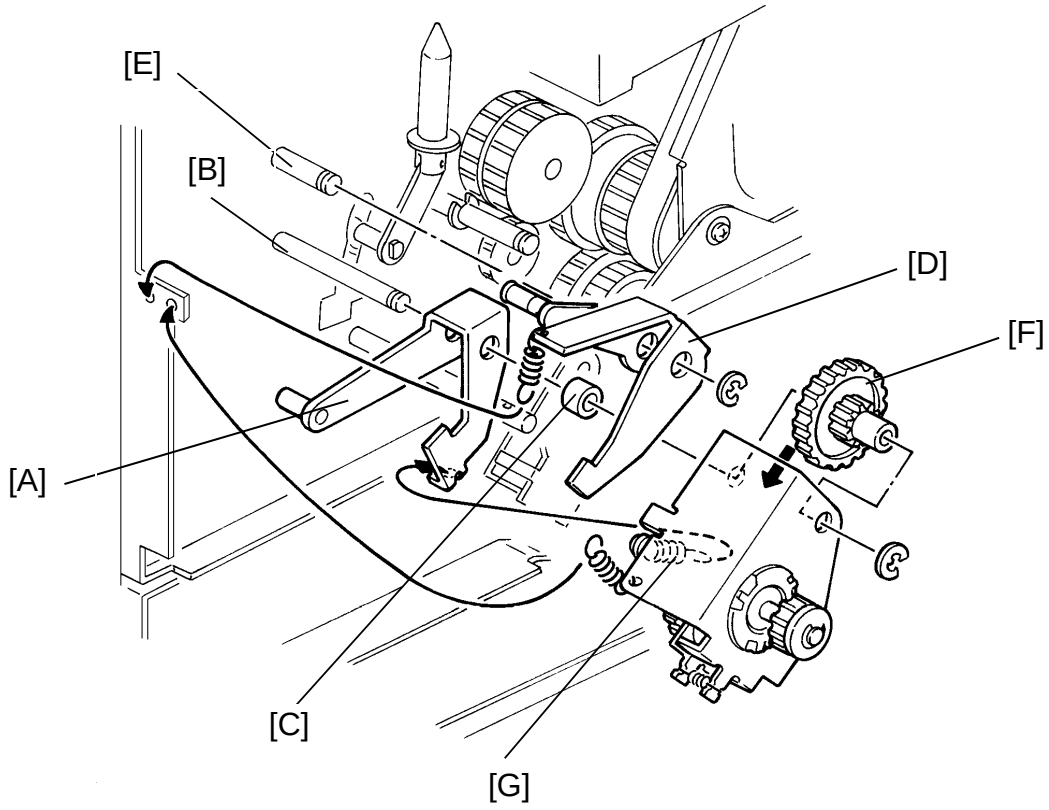


1. Turn off the main switch.
2. Remove the rear cover.
3. Remove the main board (5 locking supports and all connectors).
4. Remove the solenoid bracket [A] (1 screw).
5. Replace the solenoid [B] (1 screw). Press down on the stopper lever [C] while securing the solenoid bracket.

5.7 PAPER LIFT CLUTCH SOLENOID ASSEMBLY REPLACEMENT



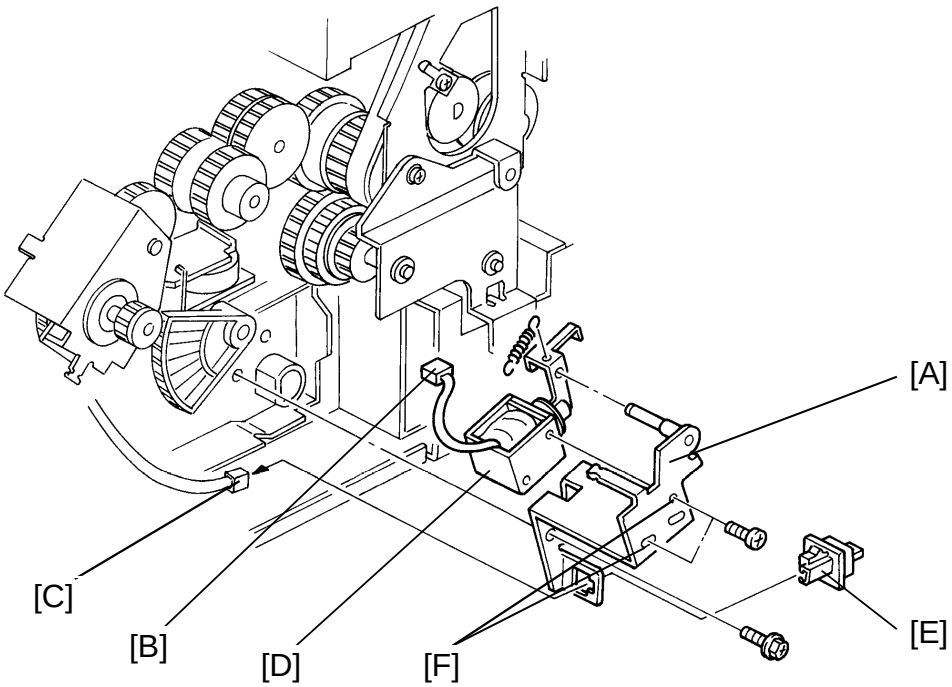
1. Turn off the main switch.
2. Remove the left and rear covers.
3. Remove the main board (5 locking support and all connectors) and main board bracket [A] (1 screw).
4. Remove the sector gear [B] (1 screw).
5. Remove the pick-up roller release solenoid bracket [C]. (See Pick-up Roller Release Solenoid Replacement.)
6. Remove the 1st feed roller spring clutch solenoid bracket [D] (1 screw). (See 1st Feed Roller Spring Clutch Solenoid Replacement.)
7. Remove the 1st feed roller spring clutch [E] (1 E-ring).
8. Remove the paper lift assembly [F] together with the manual feed table detection lever [G] (3 E-rings and two springs).
9. Remove the spring [H] from the actuator lever [I].
10. Replace the paper lift clutch solenoid assembly [J] (spring, collar, and gear).



- To install -

1. Install the actuator lever [A] on the stud pin [B].
2. Set the collar [C] on the stud pin [B].
3. Install the manual feed table detection lever [D] on the stud pin [E].
4. Place the gear [F] on the paper lift clutch solenoid assembly and install it on the stud pin [B] as shown.
5. With a pair of plyers, hook the spring [G] to the actuator lever.
6. Set the 2 E-rings and 2 springs.

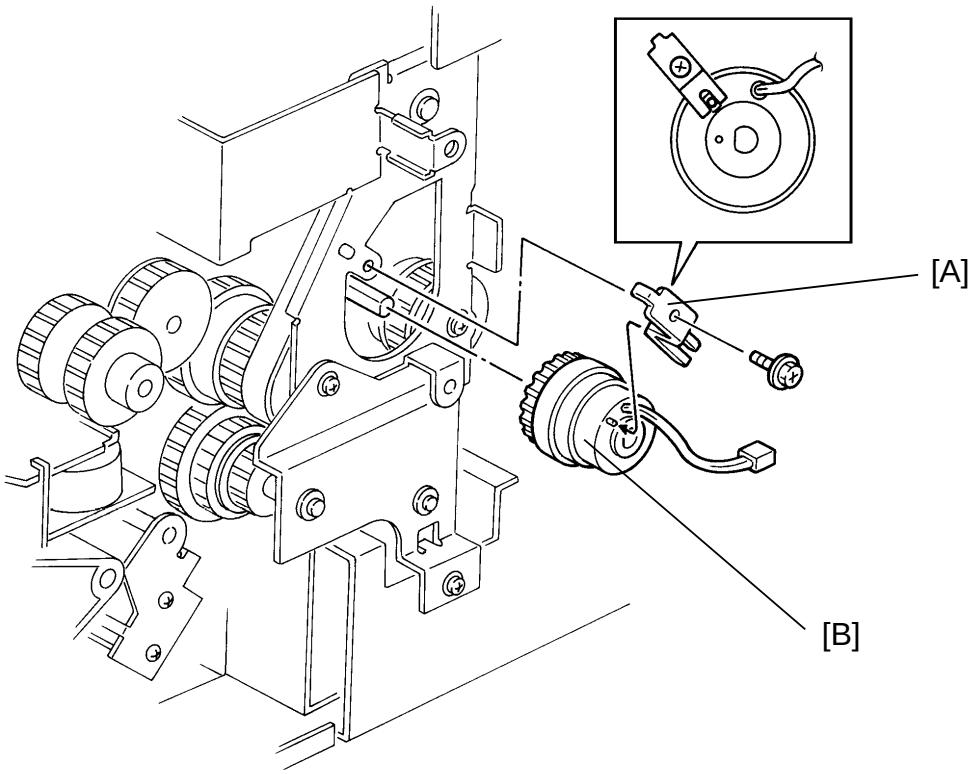
5.8 RELAY ROLLER SPRING CLUTCH SOLENOID AND RIGHT COVER SWITCH REPLACEMENT



1. Turn off the main switch.
2. Remove the rear cover.
3. Remove the solenoid bracket [A] (2 screws).
4. Disconnect the connectors [B and C] of the solenoid and switch.
5. Replace the solenoid [D] (2 screws) or switch [E].

NOTE: When attaching the solenoid to its bracket, be sure to insert the two screws into the correct holes [F].

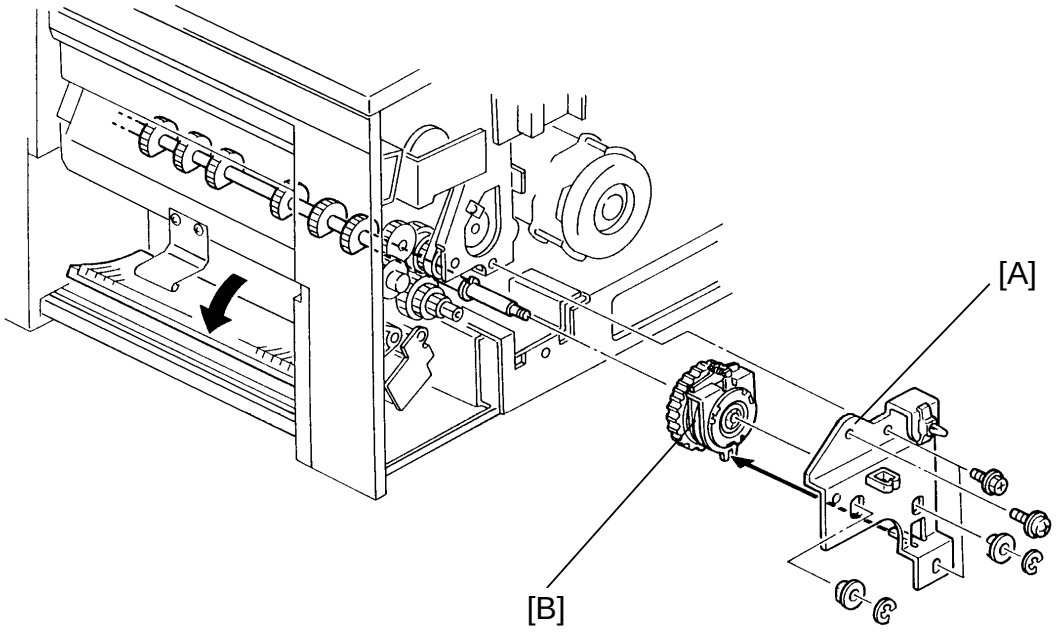
5.9 REGISTRATION CLUTCH REPLACEMENT



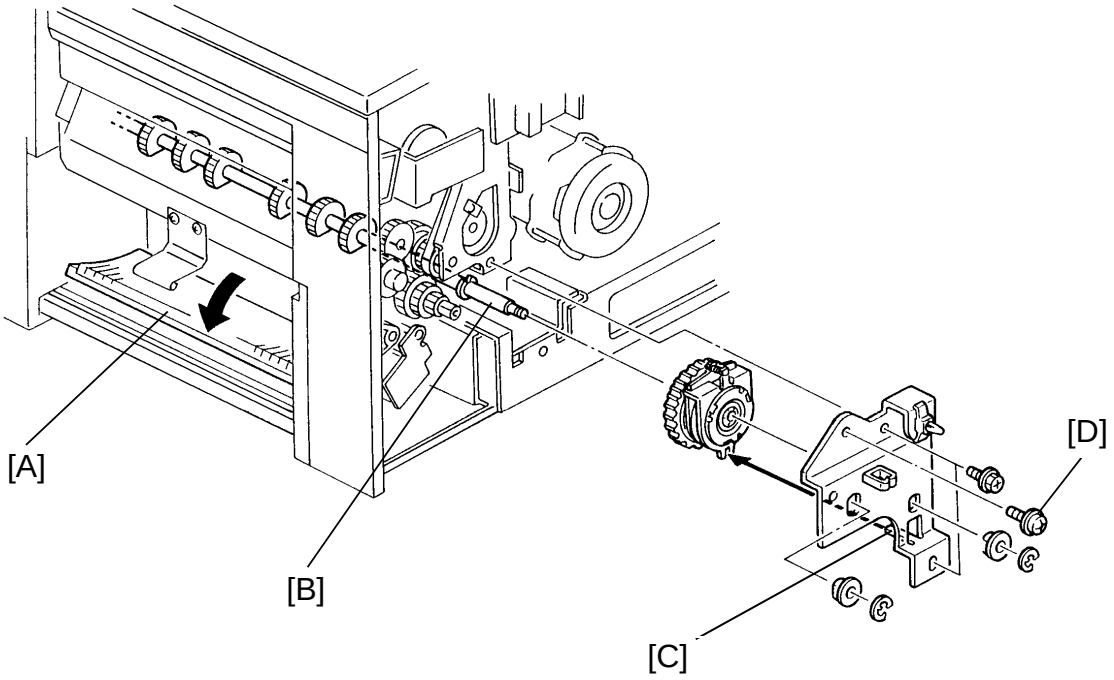
1. Turn off the main switch.
2. Remove the rear cover.
3. Remove the main board (5 locking supports and all connectors).
4. Remove the stopper bracket [A] (1 screw).
5. Replace the registration clutch [B].

NOTE: When reinstalling a new registration clutch, make sure that the stopper bracket locks the registration clutch as shown.

5.10 2ND PAPER FEED CLUTCH SOLENOID REPLACEMENT



1. Turn off the main switch.
2. Remove the rear cover.
3. Remove the main board (5 locking supports and all connectors).
4. Remove the small frame [A] (two E-rings, 3 screws, and 2 bushings).
5. Replace the 2nd paper feed clutch solenoid [B].



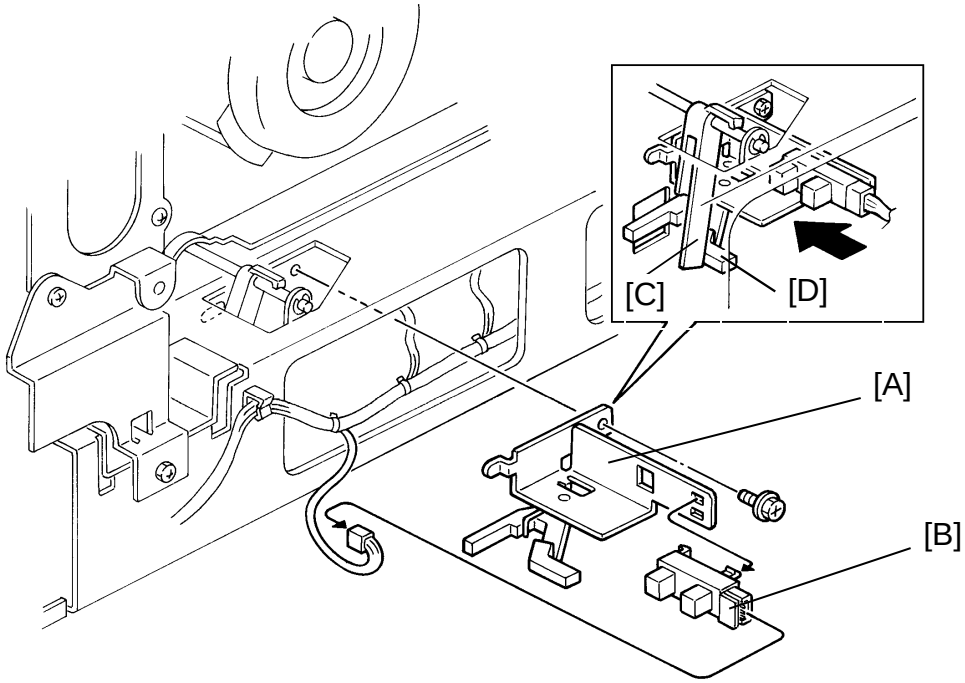
- To install -

1. Set the solenoid on the shaft.
2. Open the right cover [A] and the front cover.
3. Rotate the shaft [B] so that the 2nd feed roller faces up as shown.
4. Install the small frame.

NOTE: a) Make sure that the stopper [C] on the small frame fits into the slot on the solenoid as shown.

b) Screw [D] has a washer.

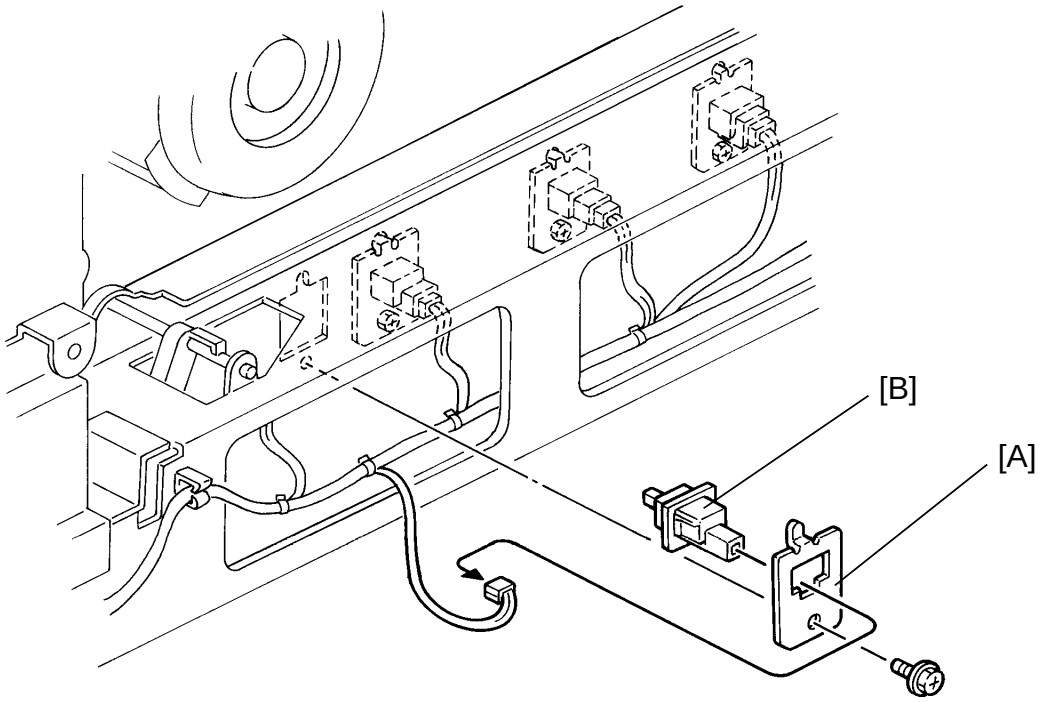
5.11 2ND PAPER END SENSOR REPLACEMENT



1. Turn off the main switch.
2. Remove the rear cover.
3. Remove the sensor bracket [A] (1 screw).
4. Replace the sensor [B] (1 connector).

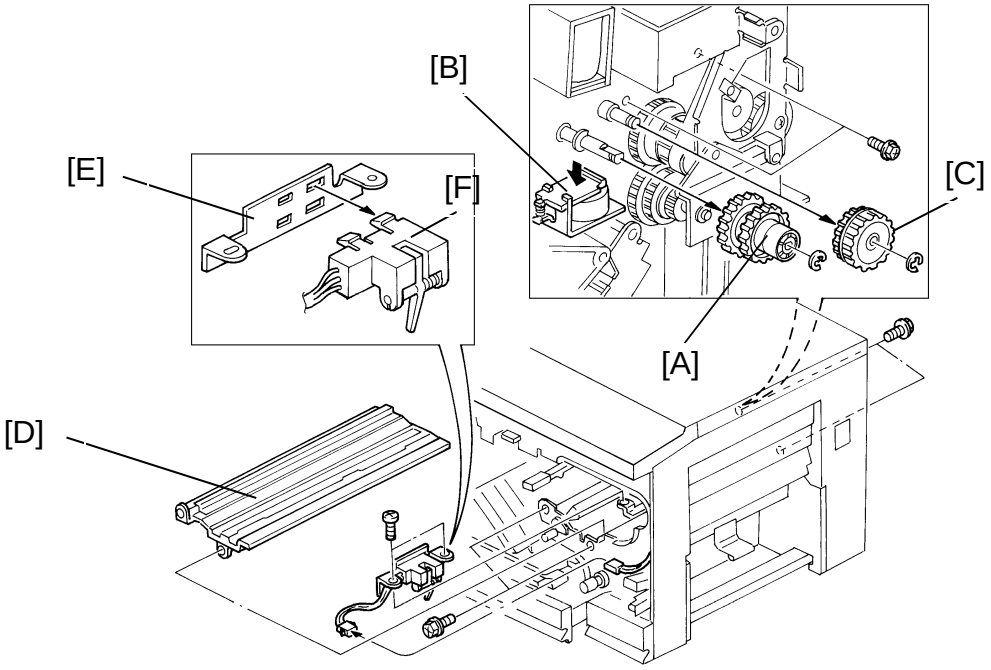
NOTE: When reinstalling the sensor bracket, make sure that the paper end actuator [C] and paper end feeler release lever [D] are properly positioned as shown. If not, the feeler may be damaged when the paper tray is inserted.

5.12 2ND PAPER SIZE SWITCH REPLACEMENT



1. Turn off the main switch.
2. Remove the rear cover.
3. Remove the switch bracket [A] (1 screw).
4. Replace the switch [B] (1 connector).

5.13 REGISTRATION SENSOR AND ROLLER REPLACEMENT

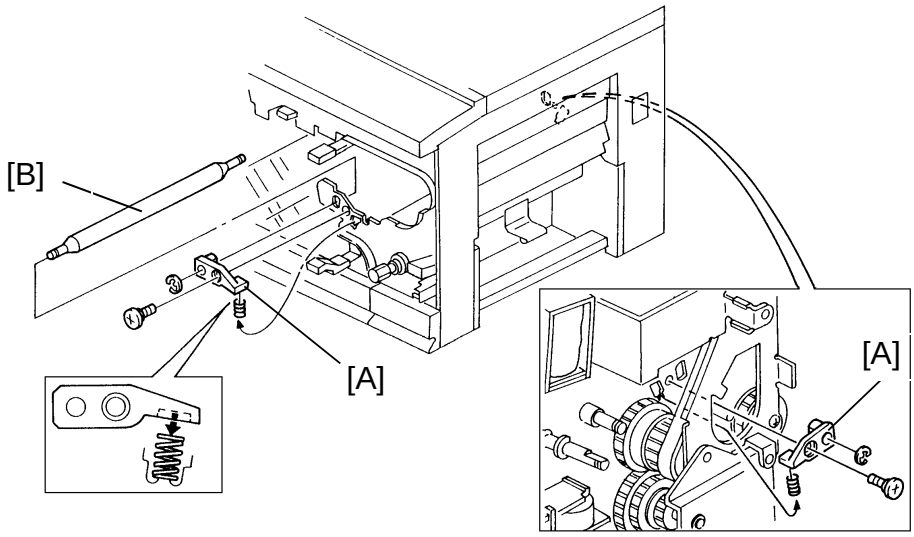


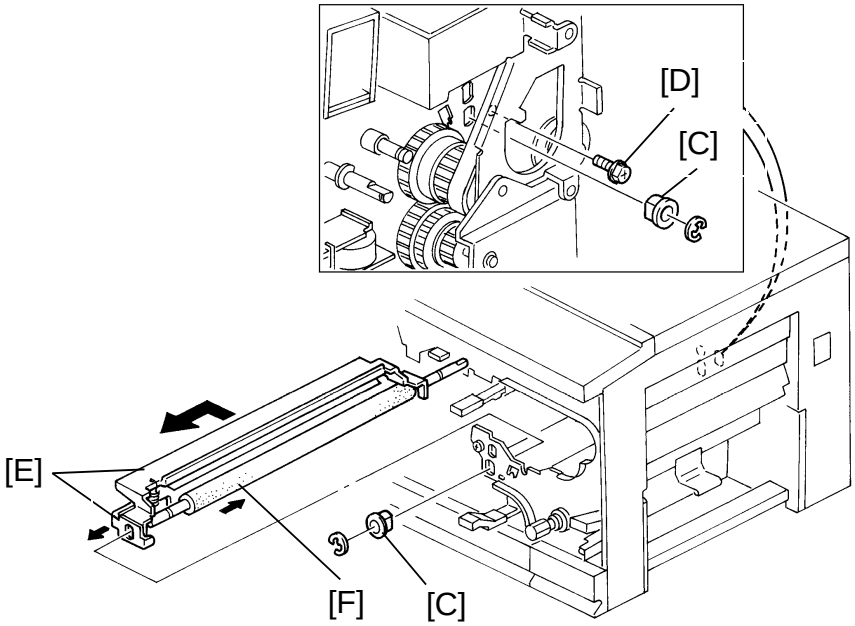
1. Turn off the main switch.
2. Remove the following parts:
   - Front cover (See Exterior Cover Removal.)
   - Development unit
   - Right inner cover (See Interior Cover Removal.)
   - Cleaning unit (See Cleaning Unit Removal.)
   - Drum unit (See Drum Unit Removal.)
   - Rear cover (See Exterior Cover Removal.)
   - Main board
   - PTL board (See PTL Board Replacement)
3. Remove the 1st feed clutch [A] while pressing down on the stopper [B] lever of the solenoid (1 E-ring).
4. Remove the idle gear [C] (1 E-ring).
5. Remove the development lower guide plate [D] (2 screws each at front and rear frames).

- Sensor -

6. Remove the sensor bracket [E] (2 screws).
7. Replace the sensor [F] (1 connector).

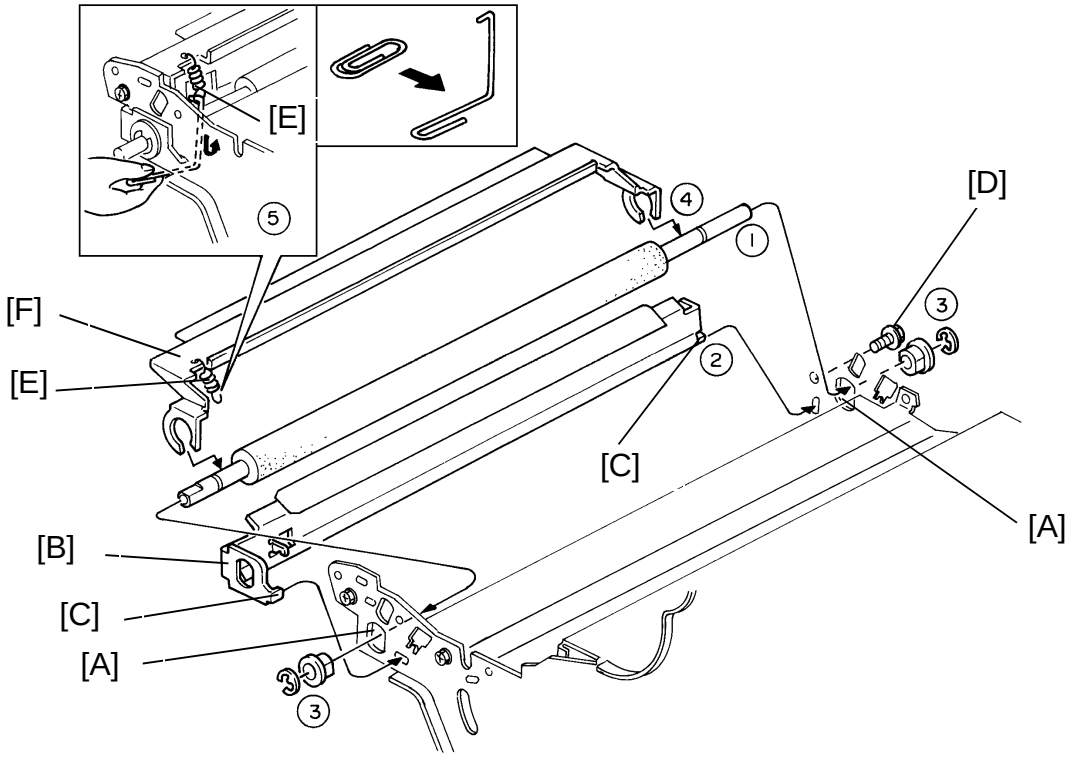
- Registration Rollers -





8. Remove the front and rear bushings [A] (1 screw, pressure spring, and E-ring each) of the upper registration roller.
9. Replace the upper registration roller [B].
10. Remove the 2 bushings [C] (1 E-ring each).
11. Remove the screw [D] securing the upper and lower guide plates [E].
12. Remove the lower registration roller [F] together with the upper and lower guide plates; then, replace the lower registration roller.

- To install (Lower Registration Roller) -



1. Set the ends of the lower registration roller shaft into the front and rear bushing holes [A].
2. Install the lower guide plate [B] with the front and rear hooks [C] in the holes.
3. Insert the bushings, set the E-rings and tighten the screw [D] securing the lower guide plate.
4. Install the spring [E] on the upper guide plate and set the upper guide plate [F].
5. Hook the spring [E] to the lower guide plate using a paper clip as shown.

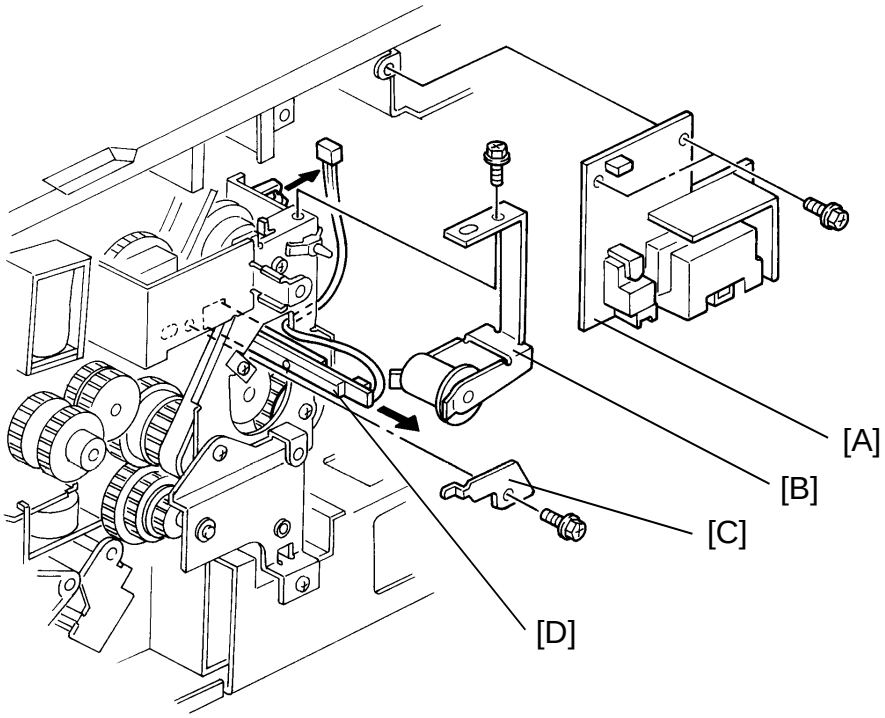
NOTE: Make sure of the following when installing the upper registration roller:

a) The front and rear bushings are different. Make sure that they are in the correct position.

b) The pressure springs are positioned correctly in the bushings.

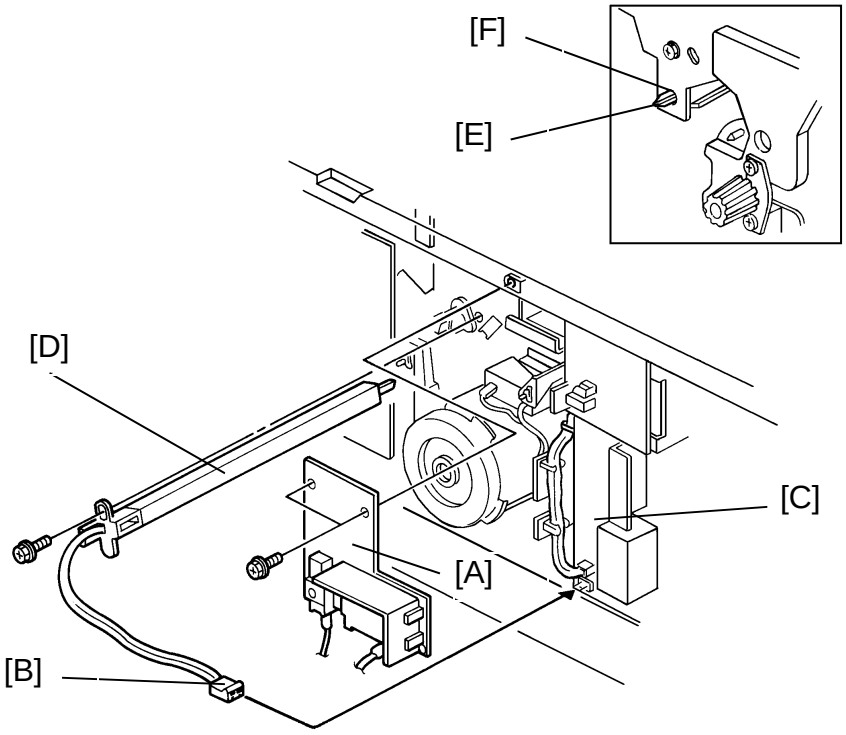
6. AROUND DRUM

6.1 PTL BOARD REPLACEMENT



1. Turn off the main switch.
2. Remove the rear cover.
3. Remove the main board (5 locking supports and all connectors).
4. Remove the TC/SC power pack [A] (2 locking supports and screws).
5. Remove the timing belt tightener [B] (1 screw).
6. Remove the PTL board stopper [C] (1 screw).
7. Replace the PTL board [D].

6.2 QUENCHING LAMP REPLACEMENT/CLEANING

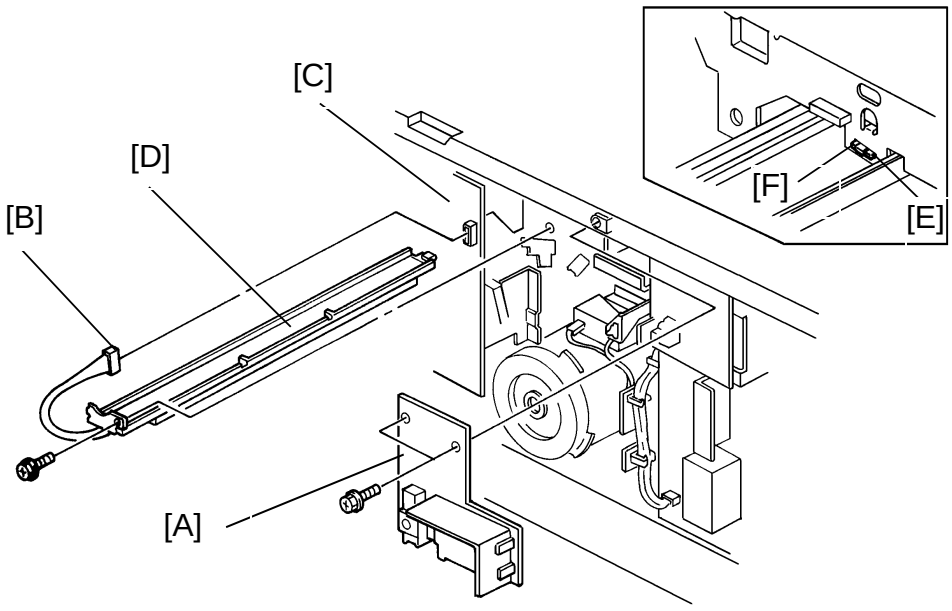


1. Open the front cover and lower the transport unit.
2. Remove the following parts:
   - Development unit
   - Cleaning unit
   - Charge corona unit
   - Drum unit
   - Rear cover
3. Remove the TC/SC power pack [A] (2 screws, locking supports, and connectors).
4. Disconnect the connector [B] (CN415) from the ac drive board [C].
5. Remove the quenching lamp [D] (1 screw).

NOTE: a) Do not use alcohol to clean the QL. This damages the resin in the LED cover.

b) When reinstalling the quenching lamp, make sure that the positioning pin [E] on the lamp fits through the cutout [F] in the front side plate as shown.

6.3 ERASE LAMP REPLACEMENT

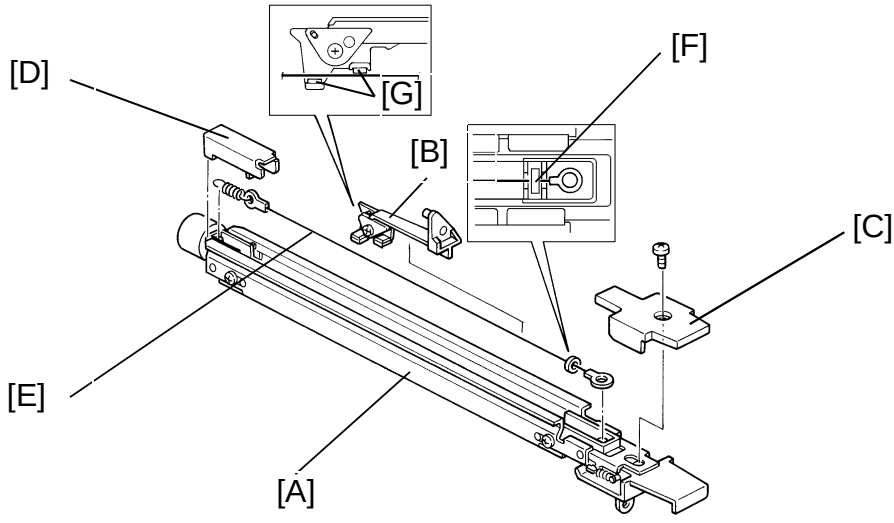


1. Open the front cover and lower the transport unit.
2. Remove the following parts:
   - Development unit
   - Cleaning unit
   - Charge corona unit
   - Drum unit
   - Rear cover
3. Remove the TC/SC power pack [A] (2 screws, locking supports, and connectors).
4. Disconnect the connector [B] (CN109) from the main board [C].
5. Remove the erase lamp [D] (1 screw).

NOTE: a) Do not use alcohol to clean the erase lamp. This damages the resin surface of he LED cover.

b) When reinstalling the erase lamp, make sure that the positioning pin [E] on the lamp fits through the cutout [F] in the front side plate as shown.

6.4 CHARGE CORONA WIRE REPLACEMENT



1. Remove the charge corona unit [A] together with the wire cleaner [B] (1 screw).
2. Remove the wire cleaner from the charge corona unit.
3. Remove the front end block cover [C] (1 screw) and the rear end block cover [D].
4. Unhook the spring from the corona wire [E] and replace the wire.

NOTE: a) Make sure that the damper ring [F] is properly positioned as shown.

b) Do not handle a new corona wire with bare hands. Oil on the wire may cause uneven charge on the drum.

c) Do not rub the corona wires with rough material (sandpaper, etc.) as this will damage the corona wires.

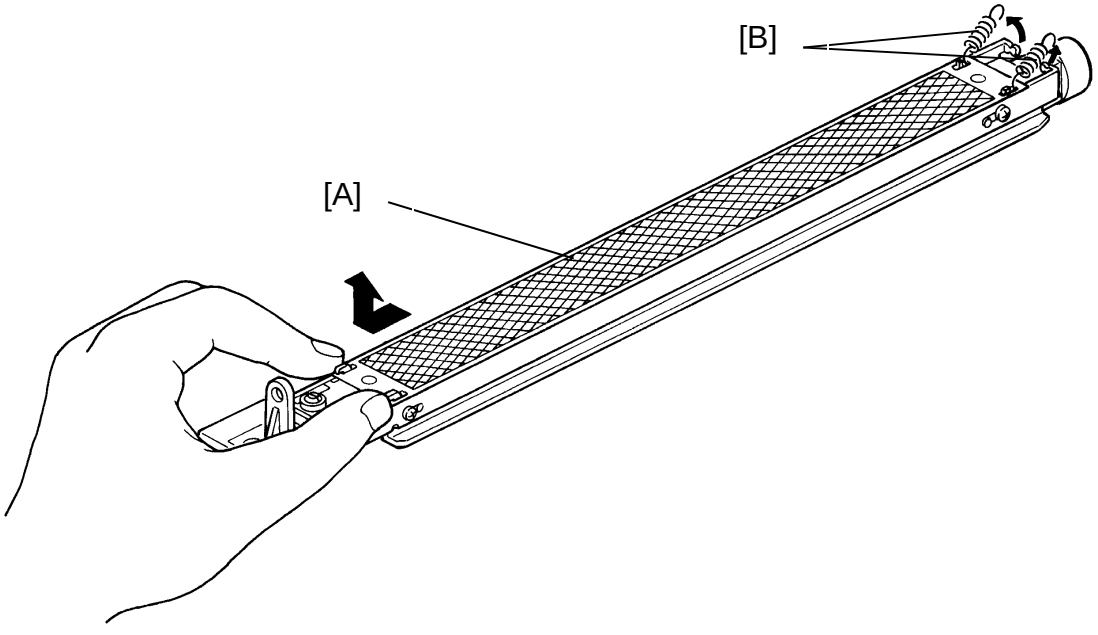
d) When removing the end block covers, be careful not to break off the side hooks.

e) Do not use any solvents to clean the wires as this will cause uneven charge on the drum.

f) Do not damage the grid when replacing the charge wire.

g) When installing the charge corona unit, make sure that the wire is positioned between the cleaner pads [G].

6.5 CHARGE CORONA GRID REPLACEMENT

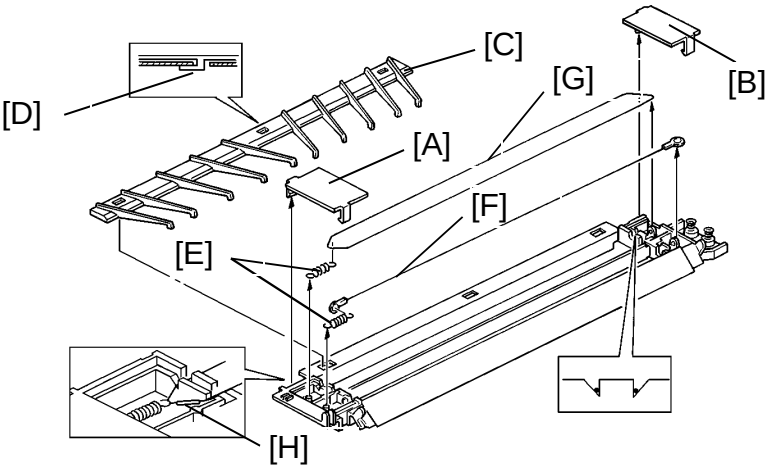


1. Remove the charge corona unit.
2. Remove the grid plate [A] (2 springs [B]).

NOTE: a) Oils and chemicals from your hands will deteriorate the grid.

b) Do not bend the grid plate. This can result in an uneven charge.

6.6 TRANSFER/SEPARATION CORONA WIRE REPLACEMENT



1. Remove the transfer/separation (TC/SC) corona unit.
2. Remove the following parts:
   - TC/SC unit front end block cover [A]
   - TC/SC unit rear end block cover [B]
   - TC/SC unit paper guide [C].

NOTE: When reinstalling the TC/SC unit paper guide, verify that all three tabs [D] are properly latched in place.

3. Unhook the springs [E] from the wires.
4. Replace the transfer corona wire [F] and the separation corona wire [G].

NOTE: a) When installing the separation corona wire, make sure that the wire junction [H] is positioned inside the front endblock.

b) The transfer and separation corona wires must be in the grooves of the front and rear endblocks as shown.

c) Do not handle new corona wire with bare hands. Oil on the wire may cause an uneven charge on the drum.

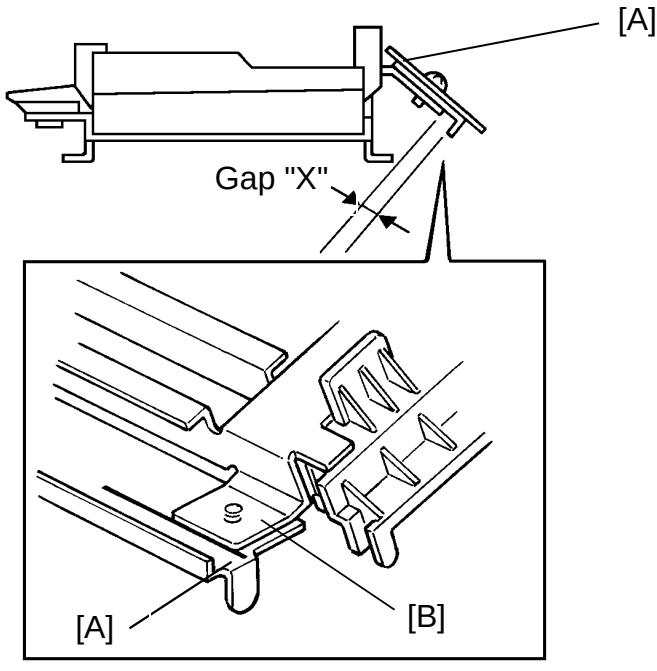
d) Rubbing the corona wires with a rough material (sandpaper, etc.) will damage the corona wires.

e) When removing the end block covers, be careful not to break off the side hooks.

f) Do not use any solvents to clean the wires as this will cause uneven charge on the drum.

g) The transfer entrance guide is positioned with a special tool at the factory.

6.7 ENTRANCE GUIDE PLATE HEIGHT ADJUSTMENT

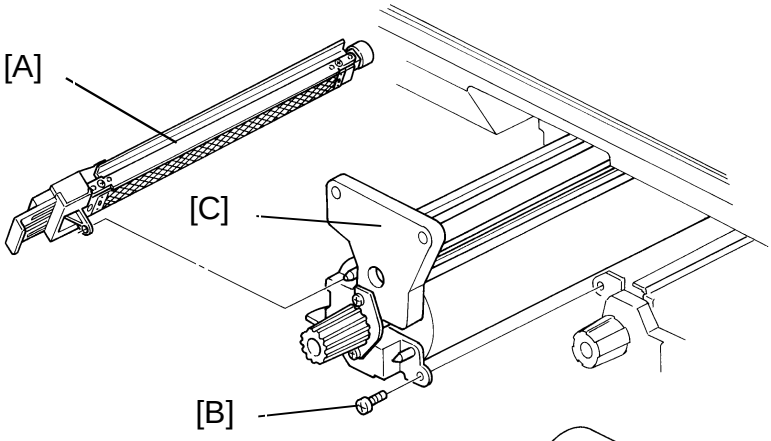


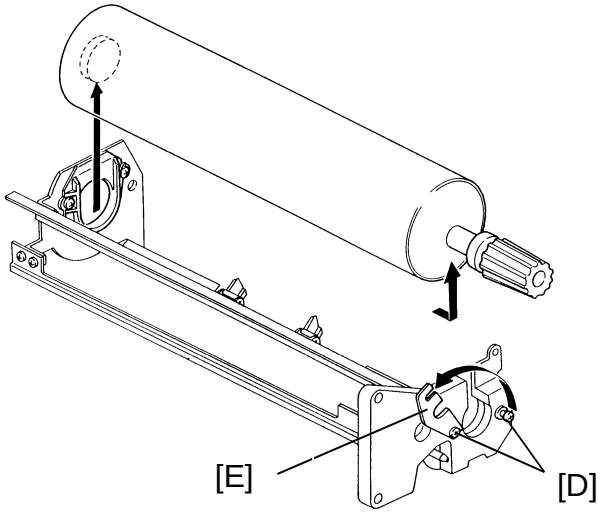
NOTE: Do not loosen or remove the entrance guide plate [A] except to replace it. The entrance guide plate height (gap between the leading edge of the entrance guide plate mylar and drum) is adjusted at the factory with special equipment.
Before removing the entrance guide plate, mark its original position as shown. Position the new entrance guide plate so that the edge of the plate is aligned with the mark.
If the original position of the entrance guide plate was not marked before the plate was loosened or removed, adjust its position as follows:

ADJUSTMENT STANDARD: GAP "X" Front 2.65 ± 0.1 mm
Rear 3.25 ± 0.1 mm

1. Set the gap "X" between the edge of the bracket [B] and the entrance guide plate adjustment standard using the thickness gauge as shown in the illustration. Then, tighten both the front and rear screws.
2. Make sure that the leading edge of the entrance guide plate mylar does not contact the drum after the TC/SC corona unit is installed.

6.8 DRUM REPLACEMENT

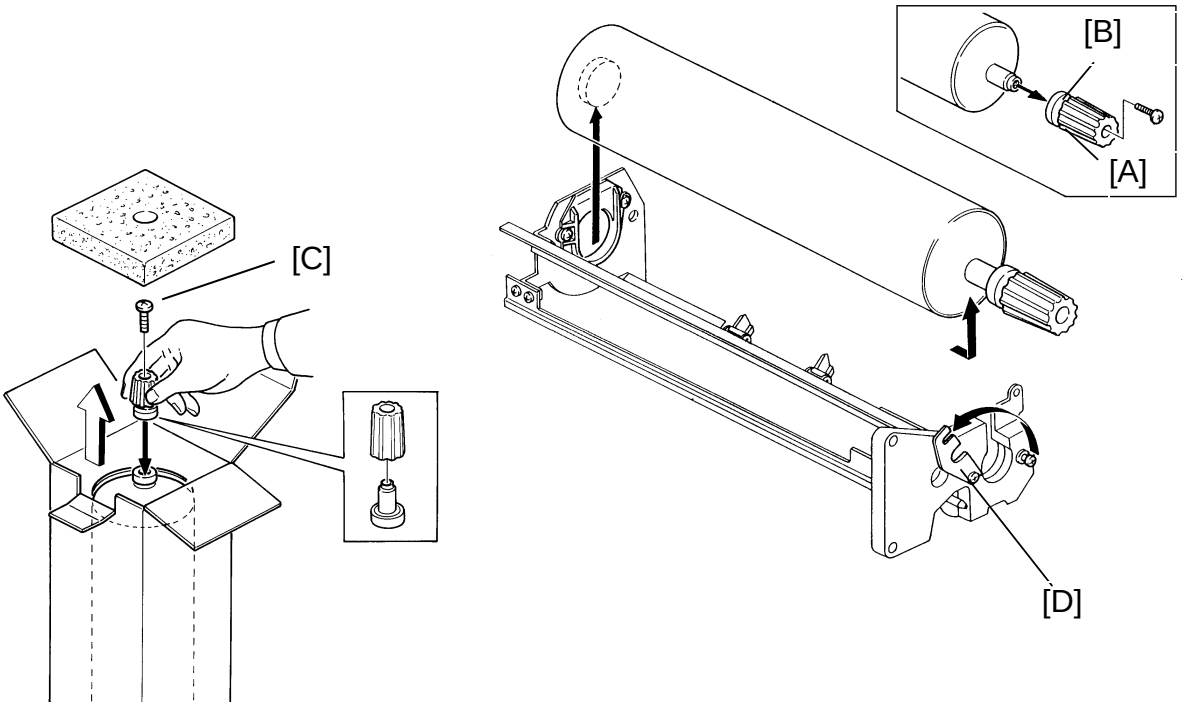




1. Lower the transport unit.
2. Remove the following units:
   - Development unit
   - Cleaning unit
   - Charge corona unit [A] and wire cleaner
3. Remove the fixing screw [B] securing the drum stay and pull out the drum unit [C] gently along the rail.
4. Place the drum unit on a sheet of paper. Loosen the two screws [D] securing the bearing holder and rotate the holder as shown.
5. Remove the drum by holding the drum unit rail and pulling out and up on the drum knob.

NOTE: a) When removing the drum, take care not to strike it against any objects.

b) Be careful not to bend the bearing holder [E].



6. Remove the drum knob [A] and the bearing [B] and install them with the screw [C] on the new OPC drum. Do not remove the protective sheet from the new drum.

7. Set the OPC drum in the unit and put the bearing holder [D] back in place. Tighten the screws.

NOTE: a) When setting the drum in the unit, be careful not to strike it against the rail.

b) Do not bend the bearing holder. Make sure the bearing holder is in contact with the bearing [B], as they are both used to ground the unit. If they are not in contact, solid black copies may occur.

c) Do not touch the drum surface.

8. Set the drum unit in the machine and remove the drum protective sheet.

9. Reinstall the other units around the drum unit.

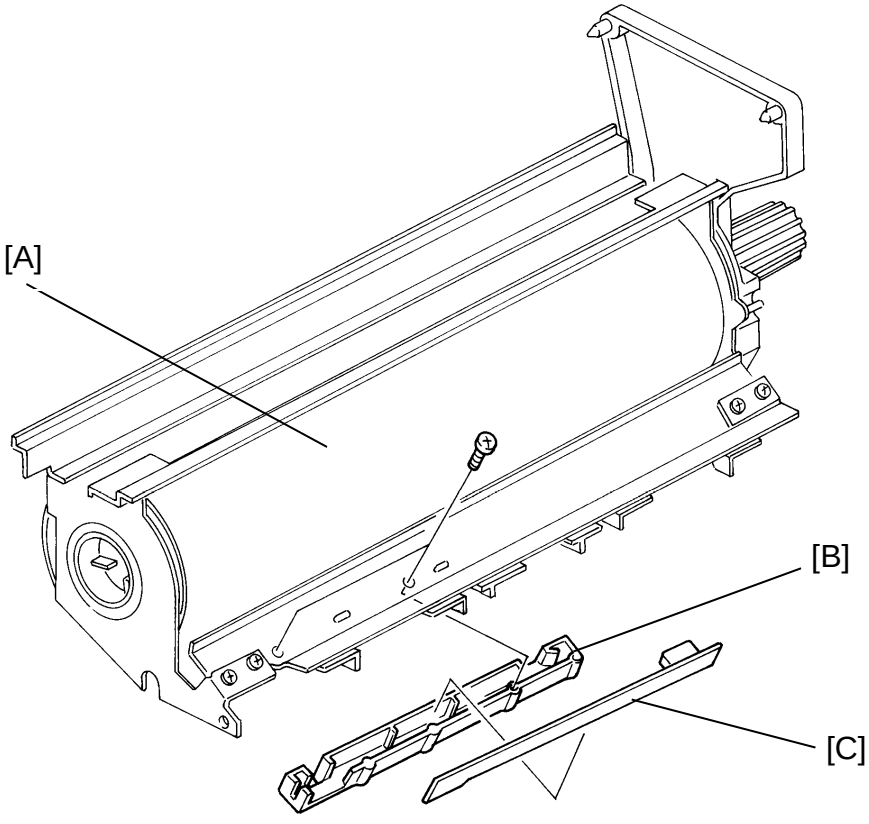
10. To access the SP mode, press in sequence the Mode Clear key, Clear/Stop key and the Enter key.

11. Reset the drum counter using SP mode #66.

NOTE: The drum counter must be reset by SP Mode #66 whenever an OPC drum is replaced.

12. Perform the ID sensor (Vsg) adjustment (SP mode #54).

6.9 ID SENSOR REPLACEMENT

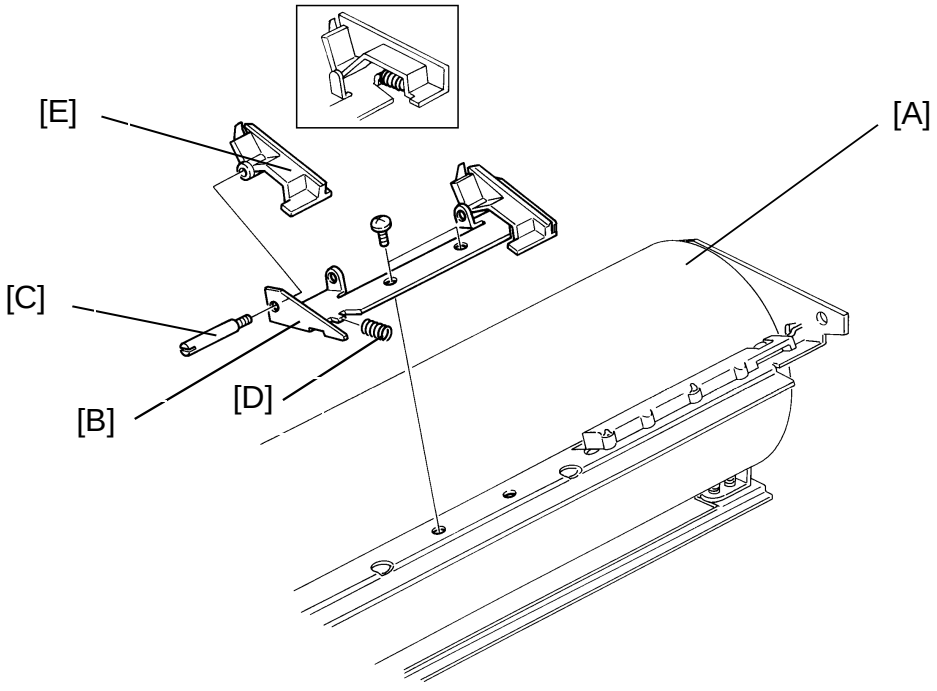


1. Remove the drum unit, then remove the drum [A] from the unit. (See Drum Replacement.)

NOTE: Cover the drum with the protective sheet to prevent the drum from being exposed to light.

2. Remove the ID sensor holder [B] (2 screws).
3. Replace the ID sensor board [C].
4. Perform the ID sensor (Vsg) adjustment (SP mode #54).

6.10 PICK-OFF PAWL REPLACEMENT



NOTE: Cover the drum with the protective sheet after removing it from the drum unit. This prevents the drum from being exposed to light.

1. Remove the drum unit, then separate the drum [A] from the unit. (See the Drum Replacement section.)
2. Remove the pick-off pawl bracket [B] (2 screws).
3. Remove the screws [C] and the springs [D], then replace the pick-off pawls [E].

NOTE: When replacing the new pick-off pawls, make sure that the springs are positioned correctly as shown in the illustration.

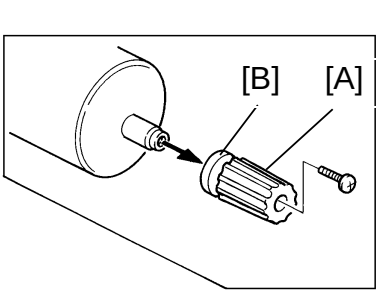
6.11 CORONA CURRENT ADJUSTMENT

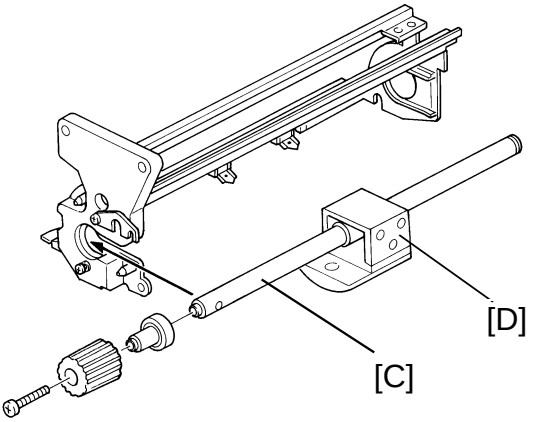
NOTE: The corona current varies with environmental conditions such as humidity and atmospheric pressure. The corona current is adjusted at the factory and is suitable under a wide range of environmental conditions. Corona current adjustment is necessary whenever the power packs are replaced; adjustment may also be necessary to correct problems with paper separation, toner transfer, or image density.

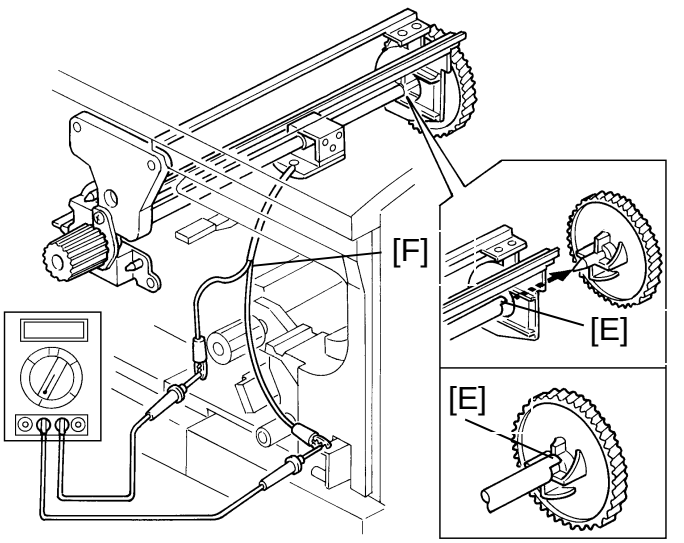
CAUTION: – Make sure that SP mode #9 is cleared before you change the range on the digital multimeter. If not, the multimeter may be damaged.
– High voltage is applied to the corona wires. Be careful.

- Preparation -

1. Turn off the main switch and remove the following parts:
   - Development Unit
   - Cleaning Unit
   - Charge Corona Unit
   - TC/SC Corona Unit
   - Drum Unit
2. Clean or replace each corona wire and clean the corona units with water or alcohol.
3. Remove the rear cover (4 screws).
4. Disconnect CN123 on the main board.





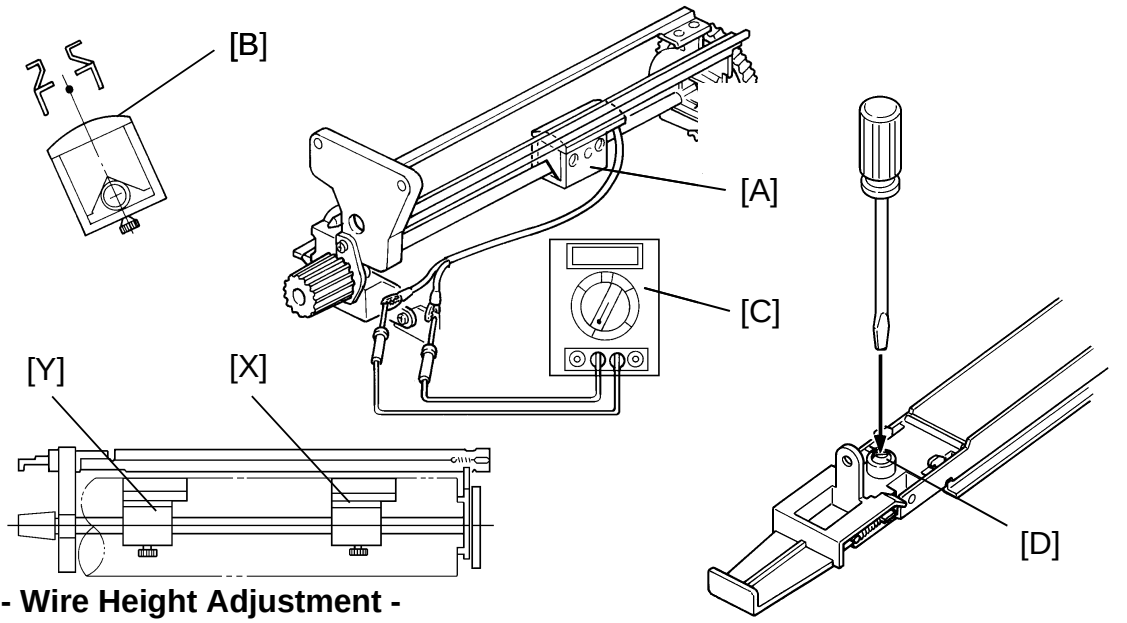


NOTE: Do steps 4 – 8 before adjusting the transfer corona current, separation corona current or charge wire height:

5. Remove the drum from the drum unit. Cover the drum with a shielding sleeve. (See Drum Replacement.)
6. Remove the drum knob [A] and the bearing [B] from the drum, then install them on the drum shaft [C] (special tool: P/N #A0069105).
7. Set the drum shaft and drum shoe [D] on the drum unit as shown.

   NOTE: Be careful not to injure your hand on the edge of the pick-off pawls.
8. Reinstall the drum unit with the shaft rear end [E] positioned as shown in the illustration. Pass the harness [F] down into the development unit.
9. Connect the negative harness lead to the copier frame, then connect both multimeter leads as shown to the harness leads.

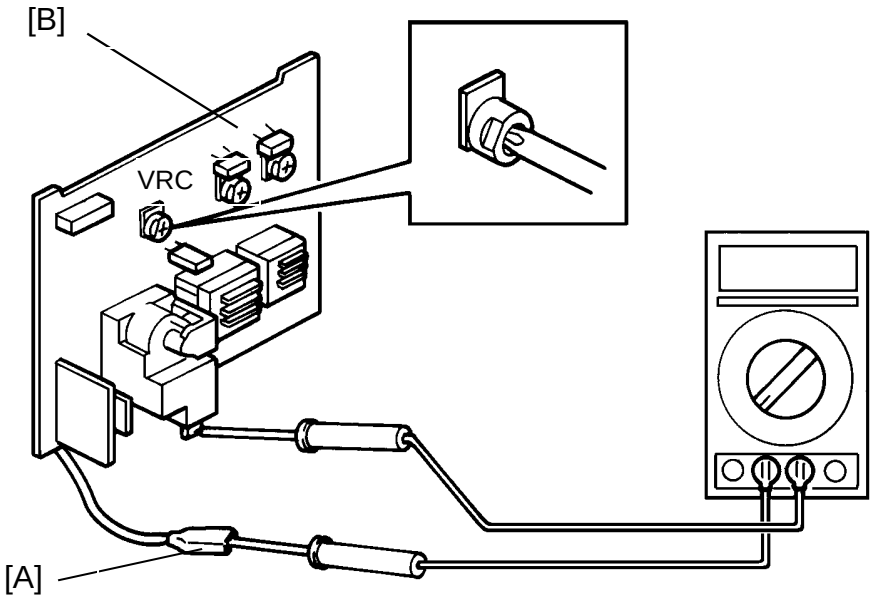
6.11.1 CHARGE CORONA CURRENT ADJUSTMENT (SP Mode #9-2)



- Wire Height Adjustment -

NOTE: If the OS-A3 test chart gray scale shows an uneven image after the front end block of the charge corona unit is replaced, check and adjust the wire height as follows:

1. Set the drum shaft and drum shoe on the drum unit and install the drum unit in the machine. (See Drum Current Adjustment Preparation.)
2. Slide the the drum shoe [A] to the rear limit [X] as shown.
3. Position the drum shoe so that the axis of the current sensing plate [B] is aligned with the charge corona wire as shown.
4. Reinstall the charge corona unit on the drum unit.
5. Select the dc 200 μA range on the digital multimeter [C].
6. Using SP mode #9–2, turn on the main switch, front door safety switch and the charge corona .
7. Note the reading. (Wait at least 30 seconds for the current to stabilize.)
8. Press the Clear/Stop key to turn off the charge corona, then move the drum shoe to the front limit [Y] as shown and repeat steps 3 to 7.
9. Adjust the front corona wire height by turning the adjusting screw [D] if the two readings are different.
10. Repeat steps 2 to 9 until the difference between the front and rear readings is no more than 4%.



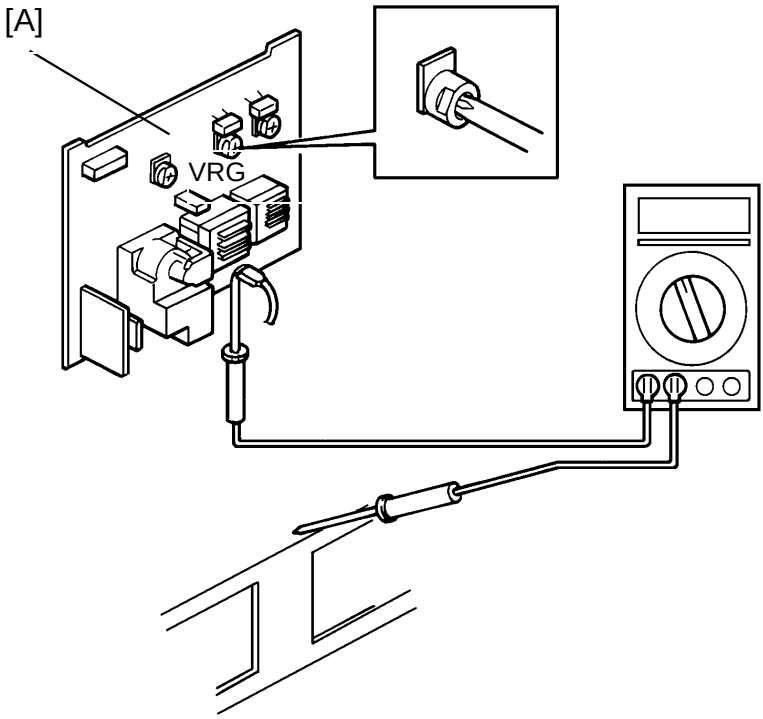
- Charge Corona Current Adjustment -

ADJUSTMENT STANDARD	Adjusting VR	SP Mode No.
DC –400 ± 2 μA	VRC	#9–2

NOTE: Keep the high voltage wire terminal [A] away from the copier frame. Otherwise, electrical leakage may interfere with current measurement.

1. Turn off the main switch.
2. Disconnect the charge corona terminal [A] from the CC/G/B power pack [B].
3. Select the dc 2mA range on the digital multimeter.
4. Connect the multimeter leads as shown, then measure the charge corona current.
5. Turn on the main switch, front door safety switch and the charge corona using SP mode #9–2.
6. Adjust the charge corona current to –400 ± 2 μA by turning VRC on the CC/G/B power pack [B].
7. Press the Clear/Stop key.

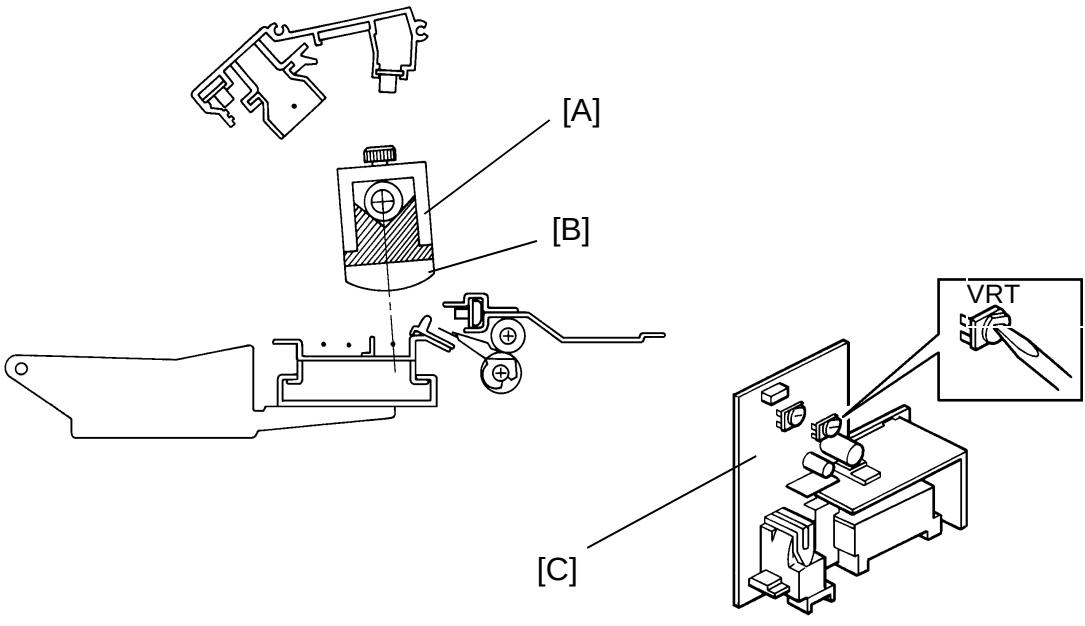
6.11.2 GRID VOLTAGE ADJUSTMENT (SP Mode #9-2)



ADJUSTMENT STANDARD	Adjusting VR	SP Mode No.
DC –920 ± 16 V	VRG	#9–2

1. Set the multimeter range to dc 1500V and connect the multimeter leads as shown.
2. Turn on the main switch, front door safety switch, and grid using SP mode #9-2.
3. Adjust VRG of the CC/G/B power pack to –920 ± 16 V by turning VRG on the CC/G/B power pack [A].
4. Press the Clear/Stop key and turn off the main switch.

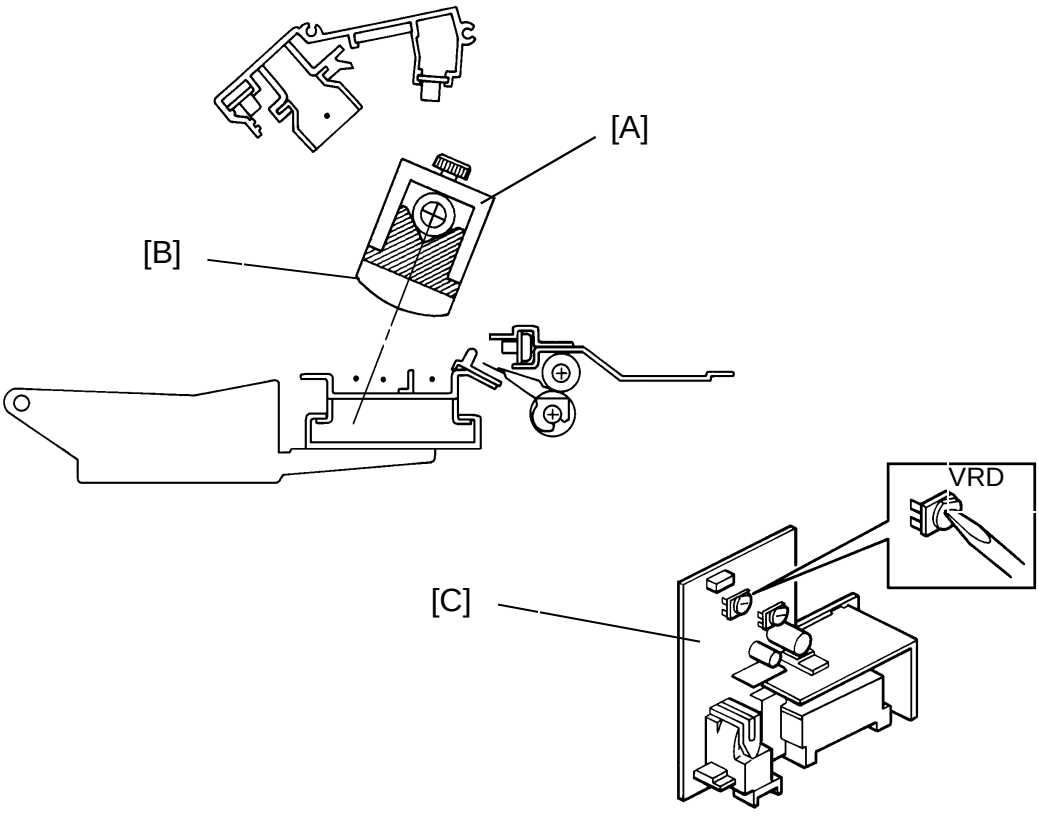
6.11.3 TRANSFER CORONA CURRENT ADJUSTMENT (SP Mode #9-5)



ADJUSTMENT STANDARD	Adjusting VR	SP Mode No.
DC –19.3 ± 0.5 μA	VRT	#9–5

1. Reinstall the TC/SC corona unit and position the drum shoe [A] on the center of the shaft so that the axis of the current sensing plate [B] is aligned with the transfer corona wire as shown.
2. Select the dc 200 μA range on the digital multimeter.
3. Turn on the main switch, front door safety switch, and transfer corona using SP mode #9–5.
4. Adjust the transfer corona current to dc –19.3 ± 0.5 μA using VRT on the TC/SC power pack [C].
5. Press the Clear/Stop key and turn off the main switch.

6.11.4 SEPARATION CORONA CURRENT ADJUSTMENT (SP Mode #9-8)



ADJUSTMENT STANDARD	Adjusting VR	SP Mode No.
AC 41.6 ± 1.3 μA	VRD	#9–8

1. Reinstall the TC/SC corona unit and position the drum shoe [A] on the center of the shaft so that the axis of the current sensing plate [B] is aligned with the separation corona wire as shown.

NOTE: Make sure that the drum shoe does not touch the pick-off pawls.

2 Select the ac 200 μA range on the digital multimeter.

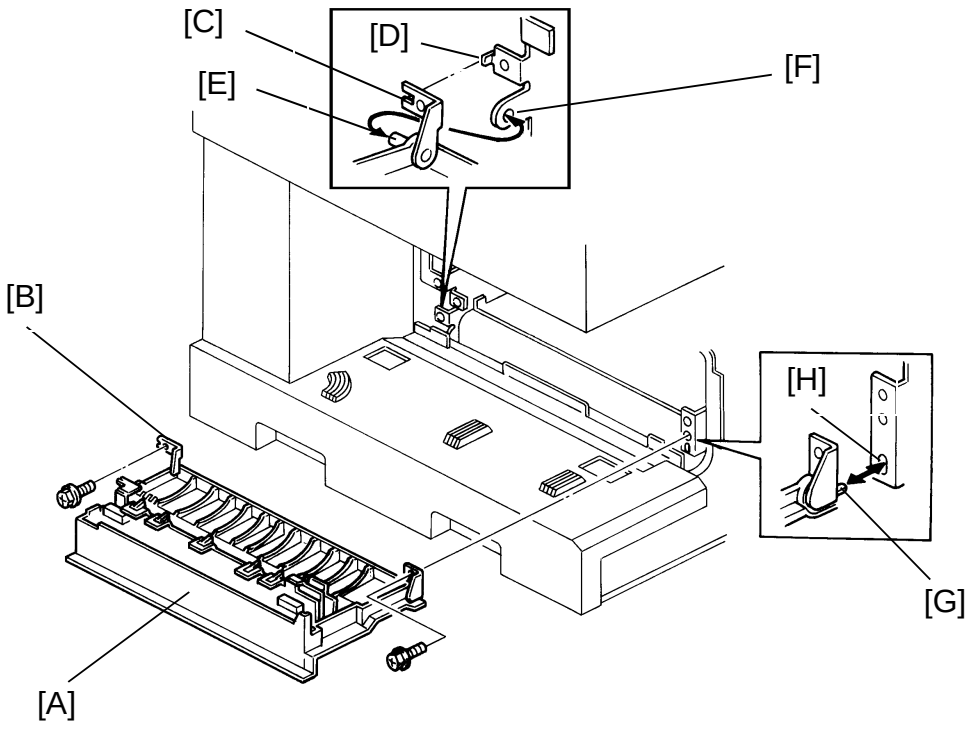
3. Turn on the main switch, the front safety switch, and the separation corona using SP mode #9–8.

4. Adjust the separation corona current to ac 41.6 ± 1.3 μA using VRD on the TC/SC power pack [C].

5. Press the Clear/Stop key and turn off the main switch.

7. FUSING

7.1 EXIT UNIT REMOVAL



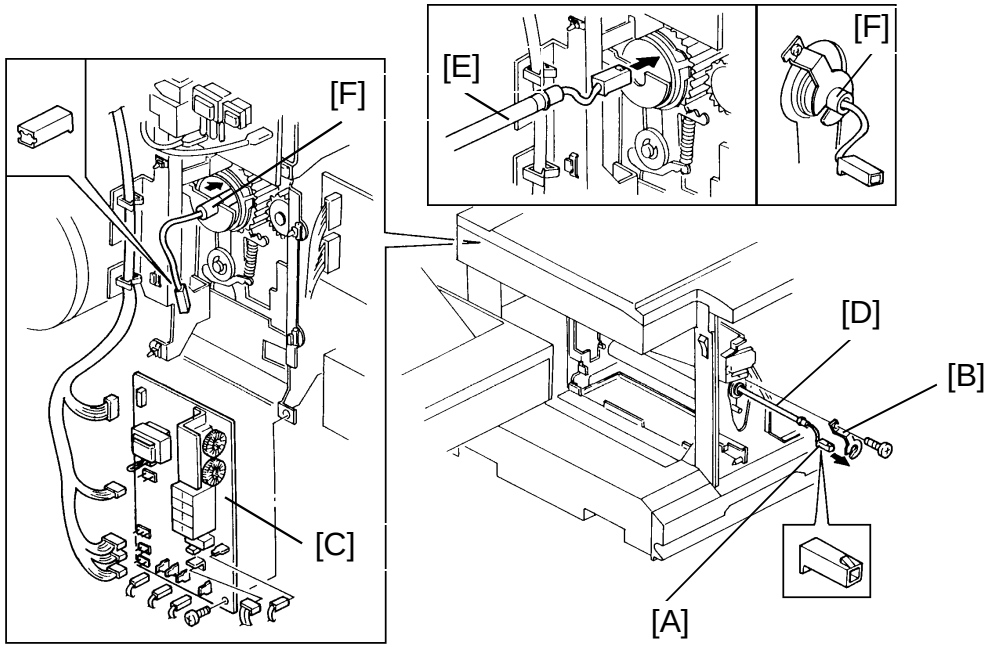
1. Remove the copy receiving tray or slide the sorter in the left side if it is installed.
2. Open the exit unit [A].
3. Remove the exit unit (2 screws and the rear holder [B]).

NOTE: When reinstalling the exit unit, make sure of the following:

a) The slot [C] in the rear holder fits over the projection [D] on the fusing unit rear frame and the holder pin [E] fits through the hole [F] as shown.

b) The projection [G] on the front holder fits through the hole [H] in the fusing unit front frame.

7.2 FUSING LAMP REPLACEMENT



1. Make sure that the main switch is turned off and the power supply cord is unplugged.
2. Open and remove the front cover.
3. Remove the left inner cover. (See Interior Covers Removal.)
4. Disconnect the connector [A] at the front side.
5. Remove the front support bracket [B] (1 screw).
6. Remove the rear cover.
7. Remove the ac drive board [C] (all connectors, 4 locking supports, and 1 screw).
8. Pull the fusing lamp [D] out the front end of the fusing roller.

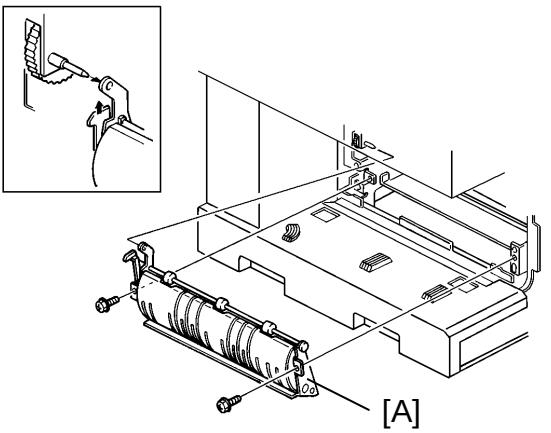
NOTE: a) Do not touch the fusing lamp with bare hands.

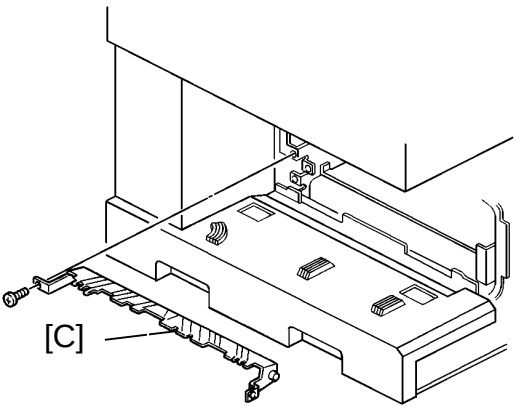
b) Slide the new fusing lamp [E] into the fusing roller through the opening at the rear of the roller. (See the arrow in the illustration.)

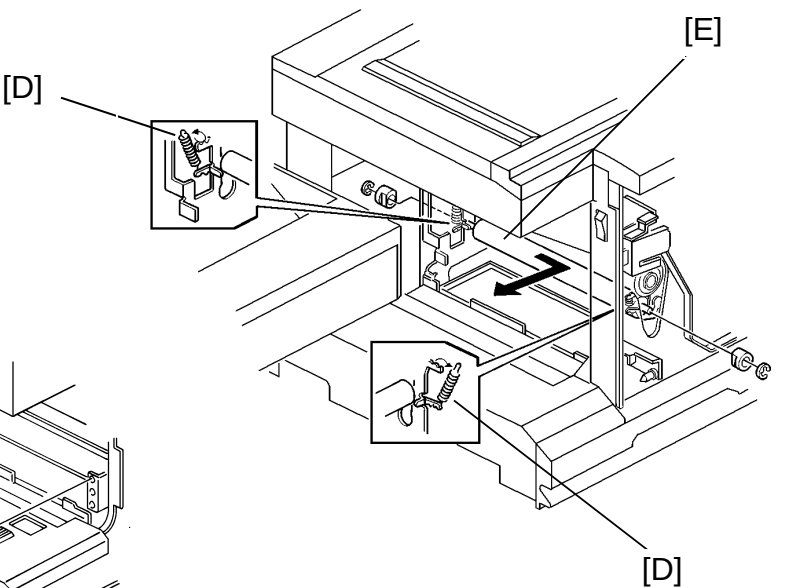
c) The connector housings used at the front and rear sides are different.

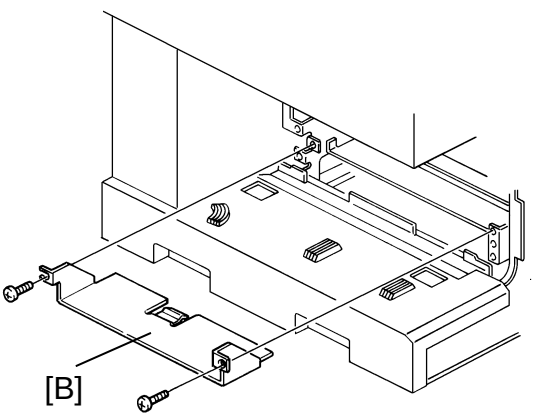
d) Make sure that the fusing lamp insulators [F] are properly set in the holders as shown.

7.3 PRESSURE ROLLER REPLACEMENT

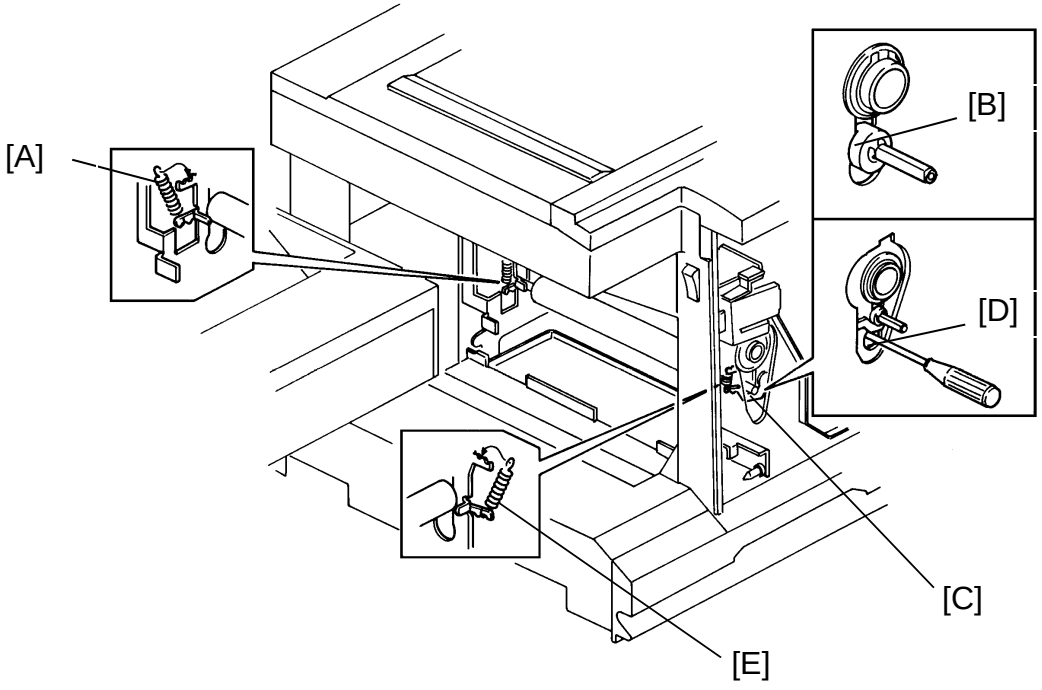








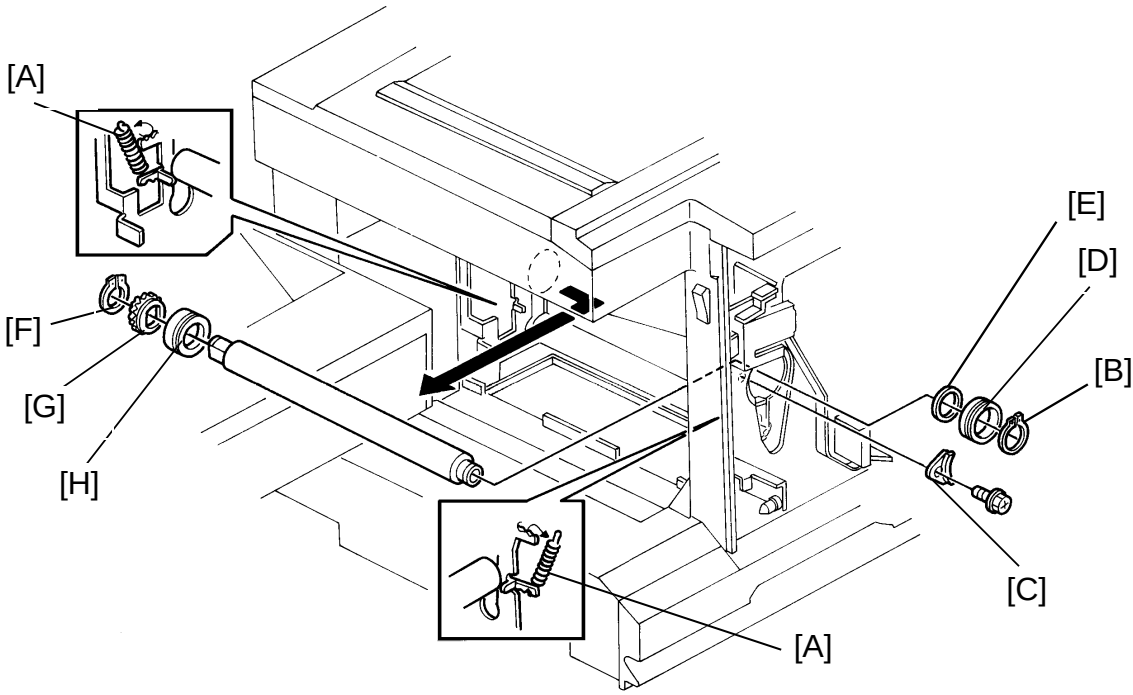
1. Remove the exit unit. (See Exit Unit Removal.)
2. If the duplex tray is installed, remove the turn guide plate [A] (2 screws). If not, remove the fusing bottom plate [B] (2 screws).
3. Remove the exit paper guide [C] (1 screw).
4. Remove the rear cover and the ac drive board. (See Fusing Lamp Replacement.)
5. Remove the front and rear pressure springs [D].
6. Replace the pressure roller [E] (2 bushings and E-rings).



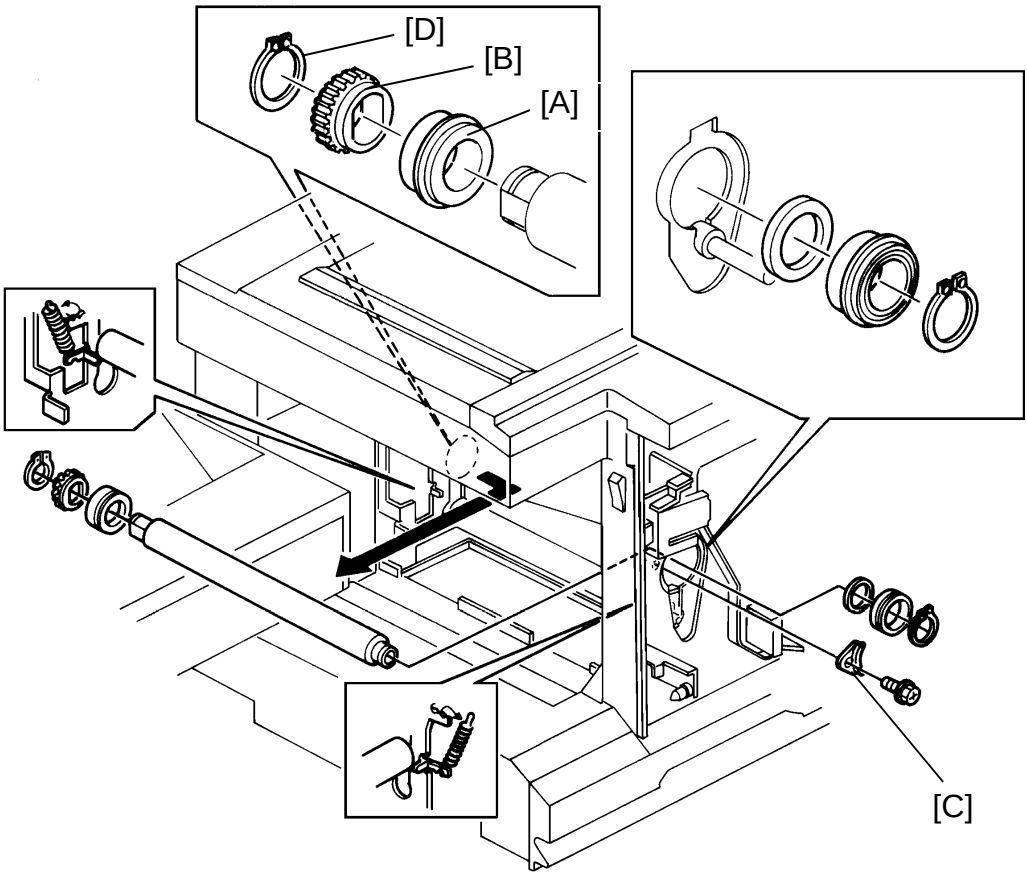
- To install -

1. Install the bushings on both the front and rear roller shafts (1 E-ring each).
2. After setting the pressure roller, install the rear pressure spring [A] while sliding the bushing [B] up along with the rear frame as shown.
3. Slide the bushing up along with the front frame and pull the lower spring bracket [C] up as shown.
4. To hold the spring bracket, insert a screw driver into the cutout [D] on the front frame as shown.
5. Install the front pressure spring [E].

7.4 HOT ROLLER REPLACEMENT



1. Remove the exit unit. (See Exit Unit Removal.)
2. Remove the fusing lamp. (See Fusing Lamp Replacement.)
3. If the duplex tray is installed, remove the turn guide plate (2 screws). If not, remove the fusing bottom plate (2 screws).
4. Remove the exit paper guide (1 screw).
5. Remove the front and rear pressure springs [A].
6. Remove the C-ring [B] (front side).
7. Remove the bearing stopper [C] (1 screw), and remove the bearing [D] and spacer [E].
8. Remove the rear C-ring [F].
9. Slide the hot roller out. The gear [G] will drop off the hot roller shaft.
10. Replace the hot roller (1 bearing [H]).



- To install -

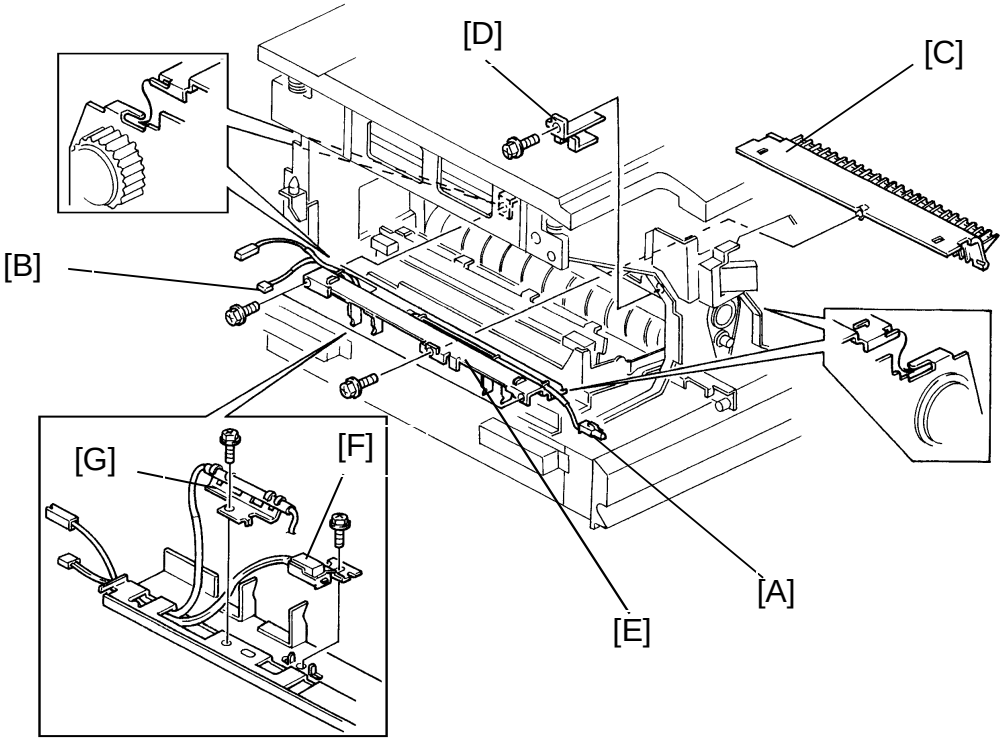
1. Set the rear bearing [A] on the rear frame.
2. Insert the rear end of the hot roller shaft through the rear bearing.
3. Place gear [B] on the rear end of the shaft.
4. Install the bearing stopper [C].
5. Set the rear side C-ring [D] on the rear shaft.

NOTE: a) Peel off 3 cm (1 inch) from both ends of the protective sheet before installing a new hot roller.

b) Before setting the pressure springs, remove the rest of the protective sheet.

c) Before reinstalling the pressure springs, refer to the installation procedure in the Pressure Roller Replacement Section.

7.5 THERMISTOR AND THERMOFUSE REPLACEMENT

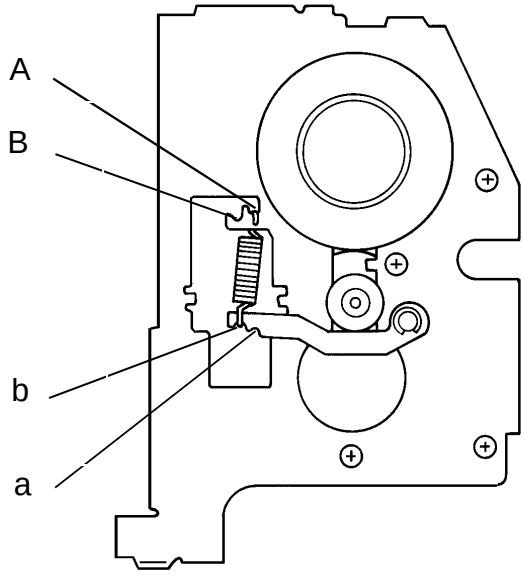


1. Turn off the main switch and unplug the power supply cord.
2. Open the front cover and remove the left inner cover.
3. Lower the transport guide plate.
4. Disconnect the fusing lamp connector [A].
5. Remove the rear cover and remove the ac drive board. (See Fusing Lamp Replacement.)
6. Disconnect the thermistor connector [B].
7. Open the exit unit and remove the cleaning unit and fusing unit cover [C] (1 screw each).
8. Remove the left upper cover. (See Left Upper Cover Removal.)
9. Remove the safety switch actuator bracket [D] (1 screw).
10. Remove the upper fusing stay [E] as shown (2 screws).
11. Replace the thermistor [F] and/or thermofuse [G] (1 screw each).

NOTE: a) When reinstalling the stay [E], make sure that the front and rear hooks stay are inserted into the side frames as shown.

b) Make sure that each harness is properly wired as shown.

7.6 FUSING PRESSURE ADJUSTMENT

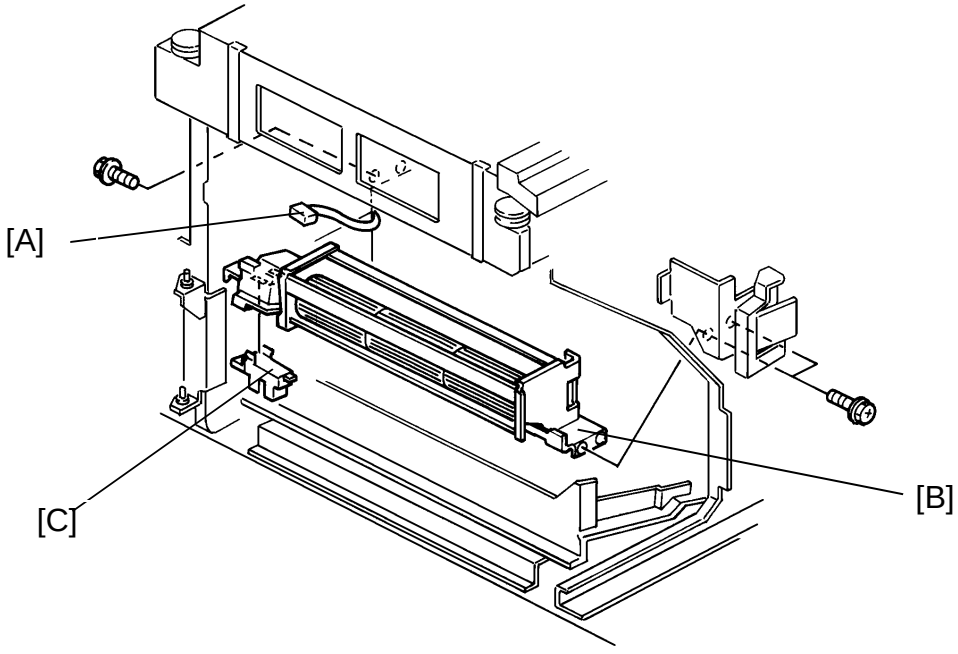


<Fusing pressure adjustment combinations>

Spring Position Setting	
A – a	If poor fusing occurs
A – b	Factory Setting
B – a	
B – b	If paper creasing occurs

The fusing pressure can be set at three different levels. Adjust the pressure spring position if poor fusing occurs or if the copy paper becomes creased. (See Pressure Roller Replacement.)

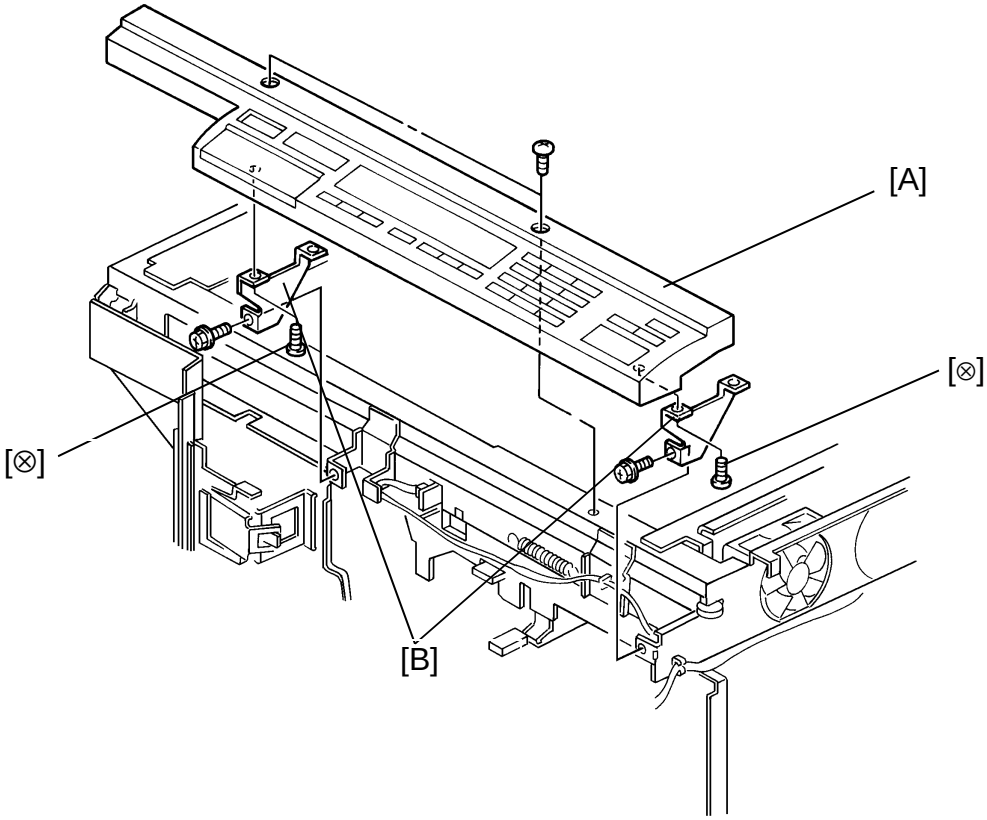
7.7 FUSING EXIT SENSOR REPLACEMENT



1. Turn off the main switch.
2. Open the front cover and exit unit.
3. Remove the following parts:
   - Left inner cover
   - Left lower and upper covers
   - Rear cover
   - AC drive board
4. Disconnect the exit sensor connector [A].
5. Remove the exhaust blower motor bracket [B] (4 screws).
6. Replace the exit sensor [C].

8. OTHERS

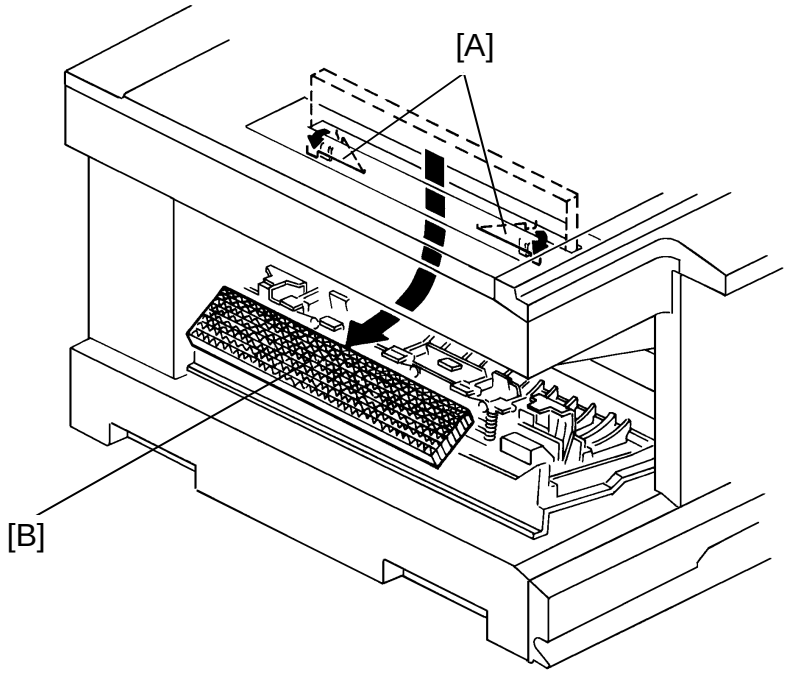
8.1 OPERATION PANEL REMOVAL



1. Open the front cover and remove the following covers:
   - Right and left inner covers
   - Right Cover
   - Rear Cover
2. Disconnect the connectors from the main board (CN130 and CN131).
3. Remove the operation panel [A] (4 screws).
4. Remove the brackets [B] from the old operation panel and install them on the new operation panel.
5. Install the new operation panel on the machine.

NOTE: The screws [⊗] are tapping screws. Do not tighten them too much as this will strip the resin threads.

8.2 OZONE FILTER REPLACEMENT



1. Open the exit unit.
2. Unhook the front and the rear support levers [A].
3. Replace the ozone filter [B].

9. COPY QUALITY ADJUSTMENT

- General Information -

Image density is affected by the following factors:

(1) Light Intensity
(2) Bias Voltage
(3) Toner Density
(4) Grid Voltage
(5) Charge Corona Current

The items listed above must be kept in balance to maintain correct image density.

In the field, image density should be adjusted first by changing the exposure lamp voltage. If results are unsatisfactory, the bias voltage can be changed. Also, if requested from the customer, the overall image density can be changed by changing the toner density. Normally, this should be kept at the normal position (factory setting).

The grid voltage and charge corona current are carefully adjusted at the factory. Any adjustment out of the adjustment standard will result in overtoning, toner scattering, dirty background, or light image density problem. The grid voltage and charge corona current adjustment should be done only when replacing the CC/G/B power pack or correct certain problems with image density after checking the other possible causes.

9.1 LIGHT INTENSITY ADJUSTMENT

When:	Every Call
Purpose:	To maintain the correct light intensity
Adjustment Standard:	Level 2 of the gray scale on the OS-A3 chart should be just visible on the copy when the 4th manual image density level is selected.
Measure:	SP Mode #48
How:	Changes the ac drive board output voltage.

1. Turn off the main switch.
2. Clean the following parts:

Item No.	Section	Method
(1)	Optics (mirrors, lens, reflectors, shield glass, exposure glass)	Damp cotton, silicine cloth, and blower brush
(2)	ID sensor	Blower brush
(3)	Corona wires (charge, transfer, and separation) and casing.	Alcohol or water
(4)	QL, PTL, Erase Lamp	Dry Cloth

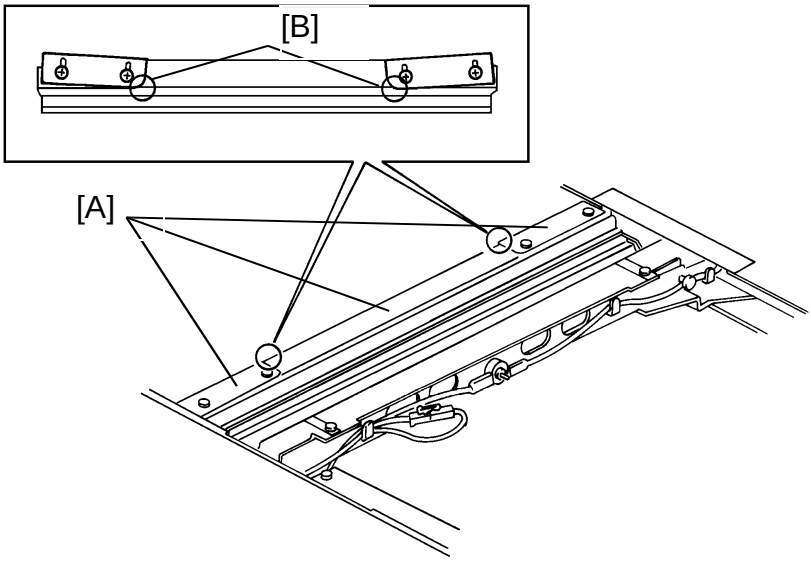
3. Set the OS-A3 chart and make a full size copy at manual image density level #4 (center).

   NOTE: Make sure that the data in SP mode #37 is set to "0" (standard value).

4. Confirm that level 2 of the gray scale is just visible on the copy. If the image density is not correct, proceed to the following steps.
5. Enter the lamp voltage setting mode using the numeral keys (SP mode #48).
6. Change the data with the numeral keys as follows:
   If the image density is too dark: Increase the data number
   If the image density is too light: Decrease the data number
7. Confirm that the image density is within the adjustment standard.
8. Perform the ADS adjustment. (See page 5-96.)

9.2 UNEVEN EXPOSURE ADJUSTMENT

When:	The exposure is uneven.
Purpose:	To maintain even exposure.
Adjustment Standard:	The side-to-side variation of the gray scales on the test chart should be less than one level.
Measure:	Move the exposure adjustment plates.
How:	Changes the position of the adjustment plates to make the light intensity from the exposure lamp even across its length.



NOTE: Do not adjust the charge corona wire height to correct the uneven image density on the copy.
When adjusting the wire height, use the drum shoe. (See Charge Corona Current Adjustment.)

1. Clean the optics components and the charge corona wire.
2. Place a test chart on the expsure glass and make a A3/LDG copy.
3. If the side-to-side variations of the gray scales is not within the adjustment standard, turn off the main switch and remove the exposure glass. (See Exposure Glass Removal.)
4. Position the adjusting plates [A] so that the copy image meets the adjustment standard. The leading edges of the three adjustment plates must be aligned [B] to avoid white streaks.

9.3 BIAS VOLTAGE ADJUSTMENT

When:	1. The image is blurred even though the image density in black solid areas is acceptable. 2. Dirty background. The problem is not caused by excess toner and cannot be solved by adjusting light intensity.
Purpose:	To improve the copy image
Measure:	SP Mode #37
How:	Changes the bias voltage while the image area on the drum is being developed.

SP Mode #37

Data	0	1	2	3	4
Bias Voltage [V]	V_0	V_0 + 40	V_0 + 20	V_0 - 20	V_0 - 40
Image Density	Normal	Darkest	Darker	Lighter	Lightest

NOTE: V_0 is the standard voltage applied to the development roller.

1. Make a copy after adjusting the light intensity.
2. If the image is blurred:
   Decrease bias voltage by one step and readjust light intensity.

   If the background is dirty:
   Increase bias voltage by one step and readjust light intensity.

9.4 TONER DENSITY ADJUSTMENT

When:	Customer wants to change the overall image density of the copies.
Purpose:	To change toner concentration inside development unit.
Measure:	SP Mode #33
How:	Changes the ID pattern bias voltage and either raises/lowers the toner supply threshold.

9.5 FIXED TONER SUPPLY MODE SELECTION

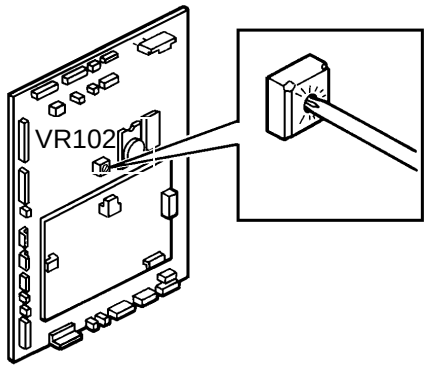
When:	A problem with the ID sensing system cannot be corrected during a service call. (Detect supply mode does not function.)
Purpose:	To leave Detect mode and manually turn on the toner supply system
Measure:	SP Mode #30
How:	Turns on the toner supply clutch every copy cycle.

9.6 TONER SUPPLY RATIO SELECTION

When:	The factory setting for toner supply amount is not appropriate for the type of original in use.
Purpose:	To adjust the toner supply amount
Adjustment Standard:	Detect Mode : 15% (Factory Setting) Fixed Mode : 7% (Factory Setting)
Measure:	Detect Mode : SP Mode #31 Fixed Mode : SP Mode #32
How:	Changes the toner supply clutch on period.

9.7 ID SENSOR (Vsg) ADJUSTMENT (SP MODE #54)

When:	1. Check Vsg at every call, and adjust Vsg if it is out of adjustment standard. 2. At replacement of the following parts: • ID sensor • Main board • Drum 3. A toner supply problem occurs.
Purpose:	To makes sure that ID sensor mode works correctly.
Adjustment Standard:	Vsg = 4.0 ± 0.2 volts
Measure:	SP Mode #54
How:	Changes the light intensity of the ID sensor LED. The Vsg voltage is displayed in the magnification indicator.



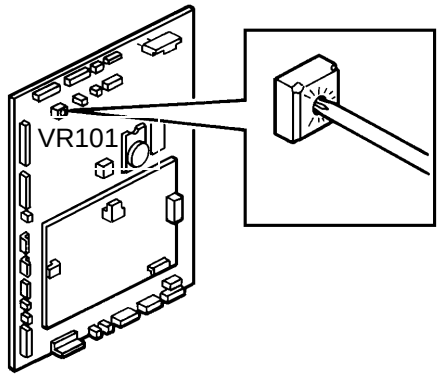
1. Turn off the main switch and clean the following parts:

Item No.	Section	Method
(1)	Optics (mirrors, lens, reflectors, shield glass, exposure glass)	Damp cotton, silicine cloth, and blower brush
(2)	ID sensor	Blower brush
(3)	Corona wires (charge, transfer, and separation) and casing	Alcohol or water
(4)	QL, PTL, Erase Lamp	Dry Cloth

2. Reinstall all the parts.
3. Place five sheets of A3 (LDG) paper on the exposure glass.
4. Check Vsg using SP mode #54. Adjust Vsg by turning VR102 (main board) if Vsg is out of adjustment standard.

9.8 ADS (Auto Image Density Sensor) ADJUSTMENT

When:	1. After light intensity adjustment 2. When replacing the following parts: • Main board • AC drive board. 3. ADS voltage is not within the adjustment standard.
Purpose:	To maintain correct ADS mode operation
Adjustment Standard:	ADS Voltage = 2.5 ± 0.1 volts
Measure:	SP Mode #56
How:	Changes the main board ADS output voltage. The voltage reading is displayed in the magnification indicator.



1. Clean the optics (mirrors, lens, reflectors, shield glass, and exposure glass).
2. Place five sheets of A3 (LDG) paper on the exposure glass.
3. Select SP Mode #56 and press the Start key.
4. If the voltage is not within the adjustment standard, adjust it by turning VR101 on the main board.

9.9 VERTICAL MAGNIFICATION ADJUSTMENT

When:	The vertical magnification is not within the adjustment standard.
Purpose:	To maintain proper vertical magnification
Adjustment Standard:	Less than ± 0.5% difference between original and copy
Measure:	SP Mode #43 (0.2%/step, 16 steps)
How:	Changes the scanner speed compensation.

1. Place a 150 mm scale perpendicular to the left scale on the exposure glass.
2. Adjust the vertical magnification using SP Mode #43. Make three copies to check the magnification.

9.10 HORIZONTAL MAGNIFICATION ADJUSTMENT

When:	The horizontal magnification is not within the adjustment standard. After loosening the first scanner wire clamps.
Purpose:	To maintain proper horizontal magnification.
Adjustment Standard:	Less than ± 0.5% difference between original and copy
Measure:	1. Adjust the position of the first scanner wire clamps (rough adjustment). 2. SP Mode #44 (0.2%/step, 16 steps) (fine adjustment)
How:	1. Changes the distance between the original and the drum. 2. Changes the lens home position.

- Rough Adjustment -

1. Change the data of SP mode #44 to 8 (default value).
2. Position the scanner wire clamps using the scanner positioning pins. (See Scanner Wire Installation.)

- Fine Adjustment -

3. Place a 150mm scale parallel to the left scale on the exposure glass.
4. Adjust the horizontal magnification using SP mode #44. Make three copies to check the magnification.

9.11 FOCUS ADJUSTMENT

When:	The copy image is out of focus. After adjusting the horizontal magnification
Purpose:	To maintain proper focus
Adjustment Standard:	Copy image in focus
Measure:	SP Mode #47 (16 steps)
How:	Adjusts the 4th/5th mirror assembly home position, changing the the distance between the original and the drum surface.

1. Make three A3/LDG copies with the test chart.
2. Adjust the focus using SP mode #47. Check the text on the copies.

9.12 ERASE MARGIN ADJUSTMENT

When:	The leading edge erase margin is not within the adjustment standard.
Purpose:	To maintain the correct leading erase margin
Adjustment Standard:	2.5 ± 1.5 mm (0.1 ± 0.06")
Measure:	SP Mode #41 (0.5mm/step, 16 steps)
How:	Changes the erase lamp on period.

1. Place a 150 mm scale perpendicular to the left scale on the exposure glass.
2. Adjust the leading edge erase margin using SP mode #41. Make three copies and check the erase margin.

9.13 REGISTRATION ADJUSTMENT

When:	Registration is not within the adjustment standard.
Purpose:	To maintain proper registration
Adjustment Standard:	0 ± 2 mm (0 ± 0.08")
Measure:	SP Mode #42 (0.5mm/step, 16 steps)
How:	Changes the registration roller start timing.

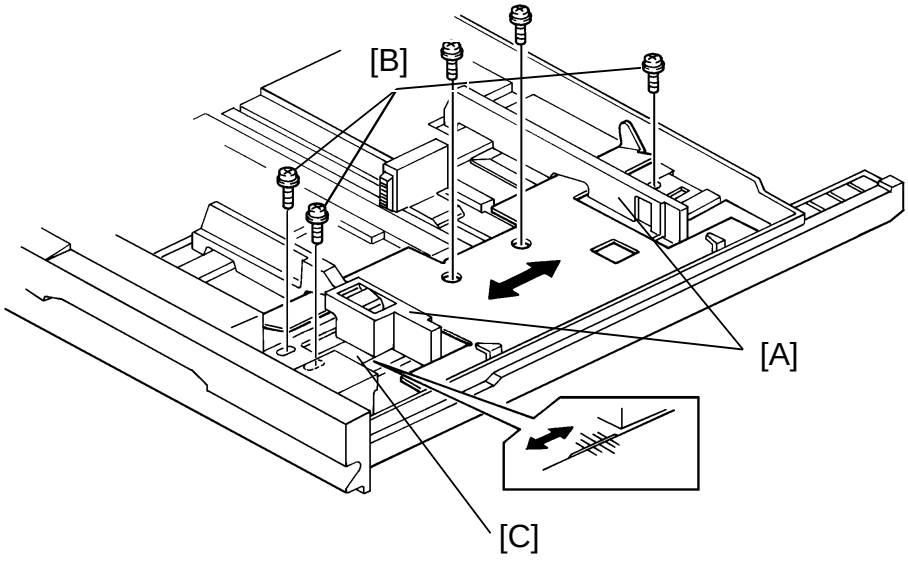
1. Place a 150 mm scale perpendicular to the left scale on the exposure glass.
2. Adjust the registration using SP mode #42. Make three copies and check the registration.

9.14 SIDE-TO-SIDE REGISTRATION ADJUSTMENT

When:	Side-to-side registration is not within the adjustment standard.
Purpose:	To maintain the proper side-to-side registration
Adjustment Standard:	0 ± 2 mm (0 ± 0.08")
Measure:	1. Change the lens position. 2. Change the sIde fence position in the paper tray.
How:	Shifts the copy image.

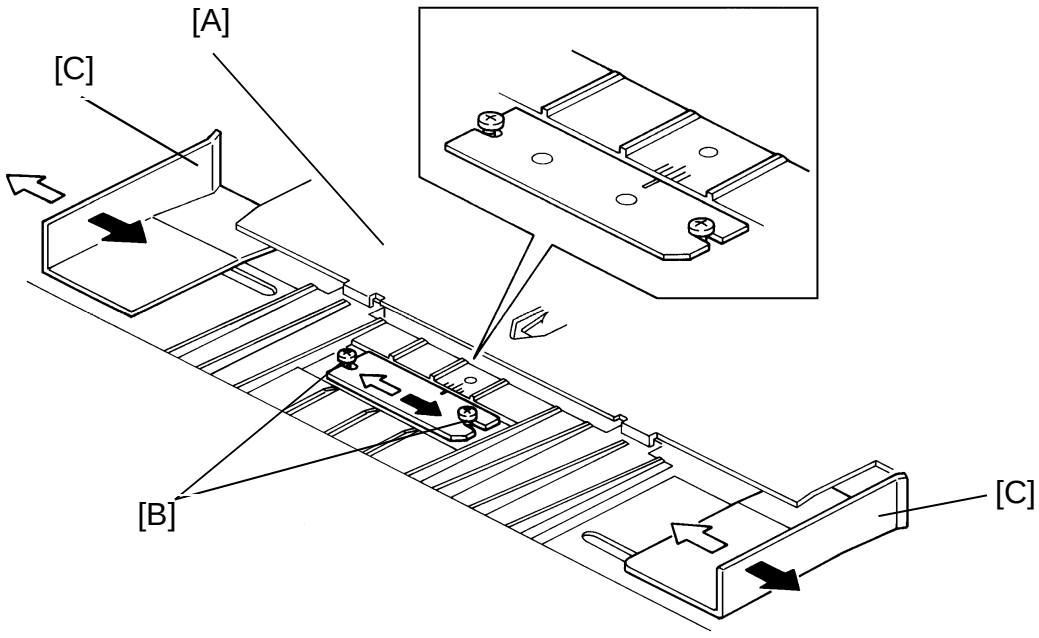
NOTE: a) When side-to-side registration is incorrect and only the paper tray or duplex unit is being used, adjust the side fence position.

b) When side-to-side registration is incorrect for both the first paper feed station and the second paper feed station, adjust the lens position. Check the adjustment by making a copy from the first paper feed station. Then, make a copy from the paper tray feed station and adjust the paper tray or duplex unit side fences if necessary.



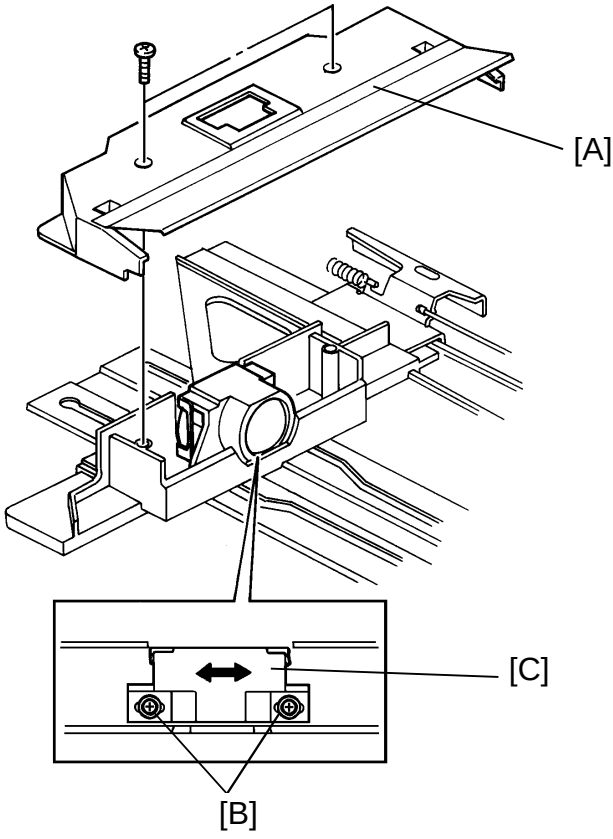
- Side Fence Adjustment (Paper Tray) -

1. Pull the paper tray out.
2. Move the side fences [A] to the A4 lengthwise position.
3. Loosen the five screws [B].
4. Set the side fences to the desired position [C].



- Side Fence Adjustment (Duplex Unit) -

1. Pull the duplex unit [A] out.
2. Loosen the two screws [B].
3. Set the side fences to the desired position [C].



- Lens Position Adjustment -

1. Turn off the main switch and remove the exposure glass. (See Exposure Glass Removal.)
2. Remove the lens housing cover (2 screws) and lens cover [A] (2 screws).
3. Loosen two screws [B] and shift the lens [C] from side-to-side to the adjust the registration.

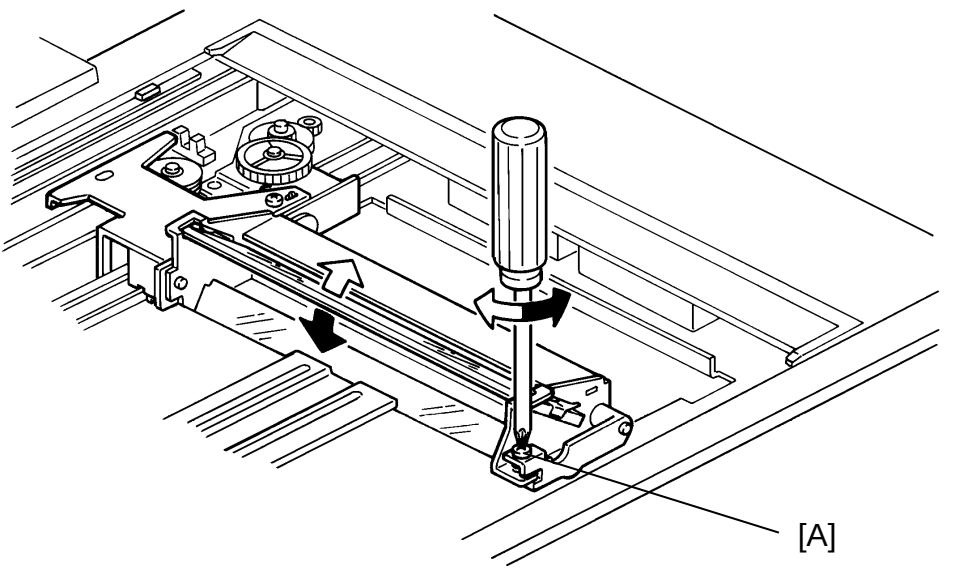
NOTE: Do not move the lens more than 2 mm (from the center position) in either direction (front/rear). Otherwise, the lens may contact the lens unit rail while moving from home position to the selected reduction or enlargement position.

4. Make sure the lens moves smoothly when charging the magnification ratio.

9.15 4TH/5TH MIRROR HEIGHT ADJUSTMENT

When:	Parallelogram (skewed) image appears.
Purpose:	To maintain the proper copy image
Measure:	Turn 4th/5th mirror height adjustment screw.
How:	Changes the 4th/5th mirror height

CAUTION: Never perform this adjustment until you have positively verified that the source of the skewing is optical and not in the paper path.

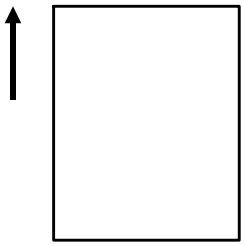


1. Turn off the main switch and remove the exposure glass. (See Exposure Glass Removal.)
2. Remove the lens housing cover (2 screws).
3. Adjust the 4th/5th mirror height by turning the screw [A]. Refer to the arrows in the illustration.

SECTION 6
TROUBLESHOOTING

1. COPY QUALITY

1.1 BLANK COPY (WHITE COPY)



- Symptom -

White or almost white copy

- Possible Causes -

1. Charge is not applied.
   - CC/G/B bias power pack (charge or grid) failure
   - Poor contact of power pack lead wires
   - Broken charge corona wire
   - Leak in insulator or endblock

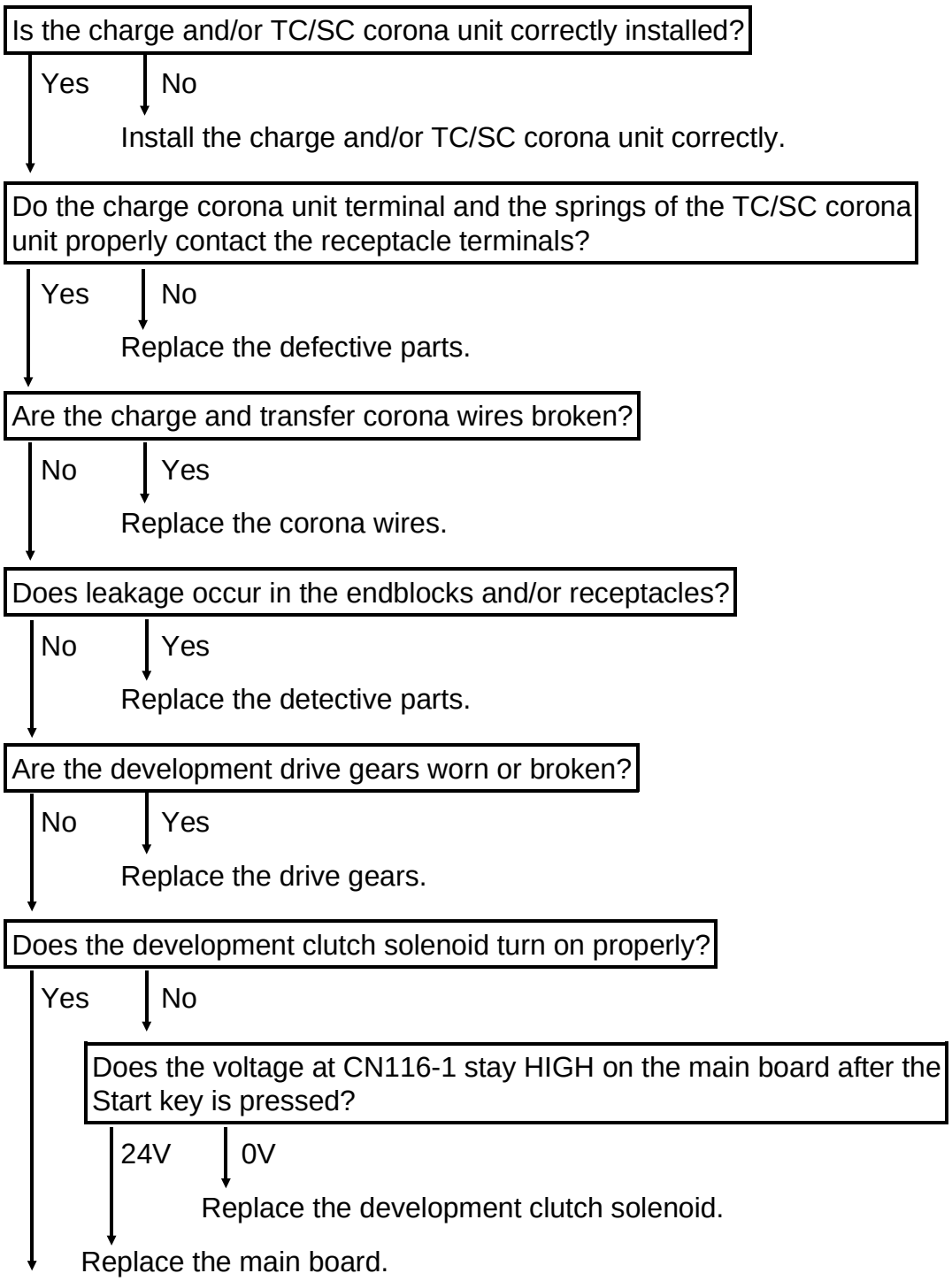
2. Copy image is not transferred to the paper.
   - TC/SC power pack (transfer) failure
   - Poor contact of power pack lead wires
   - Poor contact of transfer corona wire
   - Leak in insulator or endblocks

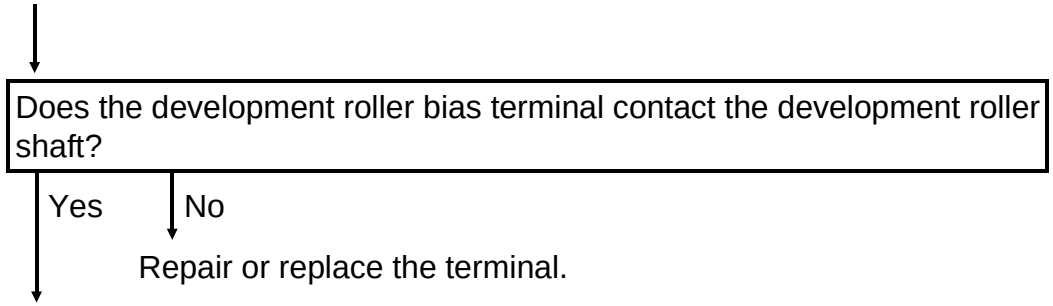
3. Development roller does not rotate.
   - Broken drive gear
   - Defective development clutch solenoid

4. The development roller is not properly grounded.

5. Poor drum sensitivity
   - Drum exposed to fluorescent light or direct sunlight for long period of time.
   - Drum exposed to ammonia gas or fumes for long period of time.

- Action -


Is the charge and/or TC/SC corona unit correctly installed?
Yes
No
Install the charge and/or TC/SC corona unit correctly.
Do the charge corona unit terminal and the springs of the TC/SC corona unit properly contact the receptacle terminals?
Yes
No
Replace the defective parts.
Are the charge and transfer corona wires broken?
No
Yes
Replace the corona wires.
Does leakage occur in the endblocks and/or receptacles?
No
Yes
Replace the detective parts.
Are the development drive gears worn or broken?
No
Yes
Replace the drive gears.
Does the development clutch solenoid turn on properly?
Yes
No
Does the voltage at CN116-1 stay HIGH on the main board after the Start key is pressed?
24V
0V
Replace the development clutch solenoid.
Replace the main board.



Check the following points:

- CN112-6 (charge trigger line) and CN112-4 (Grid trigger line)
  (1) If the signal stays HIGH after the Start key is pressed, replace the main board.

  (2) If the charge corona does not turn on even if the signal changes to LOW, replace the CC/G/B power pack.

- CN126-3 (Transfer trigger line)
  (1) If the signal stays HIGH after the Start key is pressed, replace the main board.

  (2) If the transfer corona does not turn on even if the signal changes to LOW, replace the TC/SC power pack.

If there is no problem with the signal lines, replace the drum if the sensitivity does not recover even when the drum is not exposed to light.

1.2 DIRTY BACKGROUND

- Symptom -

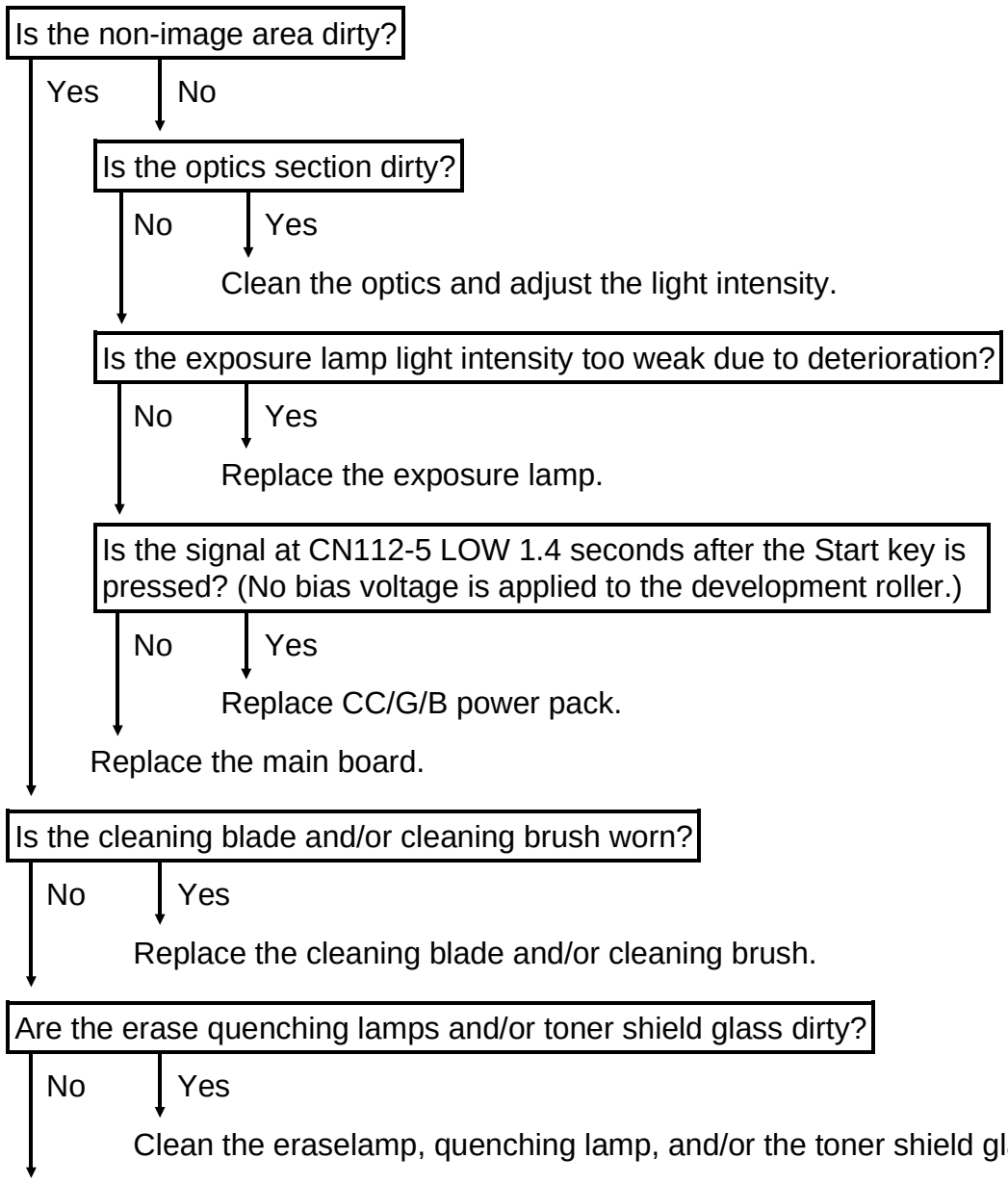
1. Dirty background at image density level 4 (manual setting)
2. When newspapers are copied, the background is dirty even at level 7.
3. ADS copies have a dirty background.

- Possible Causes -

1. Dirty optics
2. Toner scattering
   - High toner density
   - The inlet seal of the development unit is stripped off.
   - The doctor gap is too wide.
3. The exposure lamp is not bright enough. This may be caused by deterioration of the exposure lamp or low lamp voltage.
4. In ADS mode, Vde (reflected light from the original) is too high.
5. The ADS optical fiber is cut or bent.
6. The development bias is grounded.

- Action -

Make a copy in reduction mode at manual image density level 4.


Is the non-image area dirty?
Yes
No
Is the optics section dirty?
No
Yes
Clean the optics and adjust the light intensity.
Is the exposure lamp light intensity too weak due to deterioration?
No
Yes
Replace the exposure lamp.
Is the signal at CN112-5 LOW 1.4 seconds after the Start key is pressed? (No bias voltage is applied to the development roller.)
No
Yes
Replace CC/G/B power pack.
Replace the main board.
Is the cleaning blade and/or cleaning brush worn?
No
Yes
Replace the cleaning blade and/or cleaning brush.
Are the erase quenching lamps and/or toner shield glass dirty?
No
Yes
Clean the eraselamp, quenching lamp, and/or the toner shield glass.

If toner scattering occurs, see the toner scattering section of the manual.

If the dirty background occurs only in ADS mode, do the following:

- If the ADS voltage is not within 2.5 ±0.1 volts standard voltage, readjust the ADS voltage.
- If the signal at CN101-6 stays HIGH, check the harness and/or sensor, and replace defective parts.
- If the signal at CN101-5 stays LOW, replace the main board.

NOTE: After the light intensity is adjusted, check and/or adjust the ADS voltage using SP mode #56.

1.3 UNEVEN IMAGE DENSITY

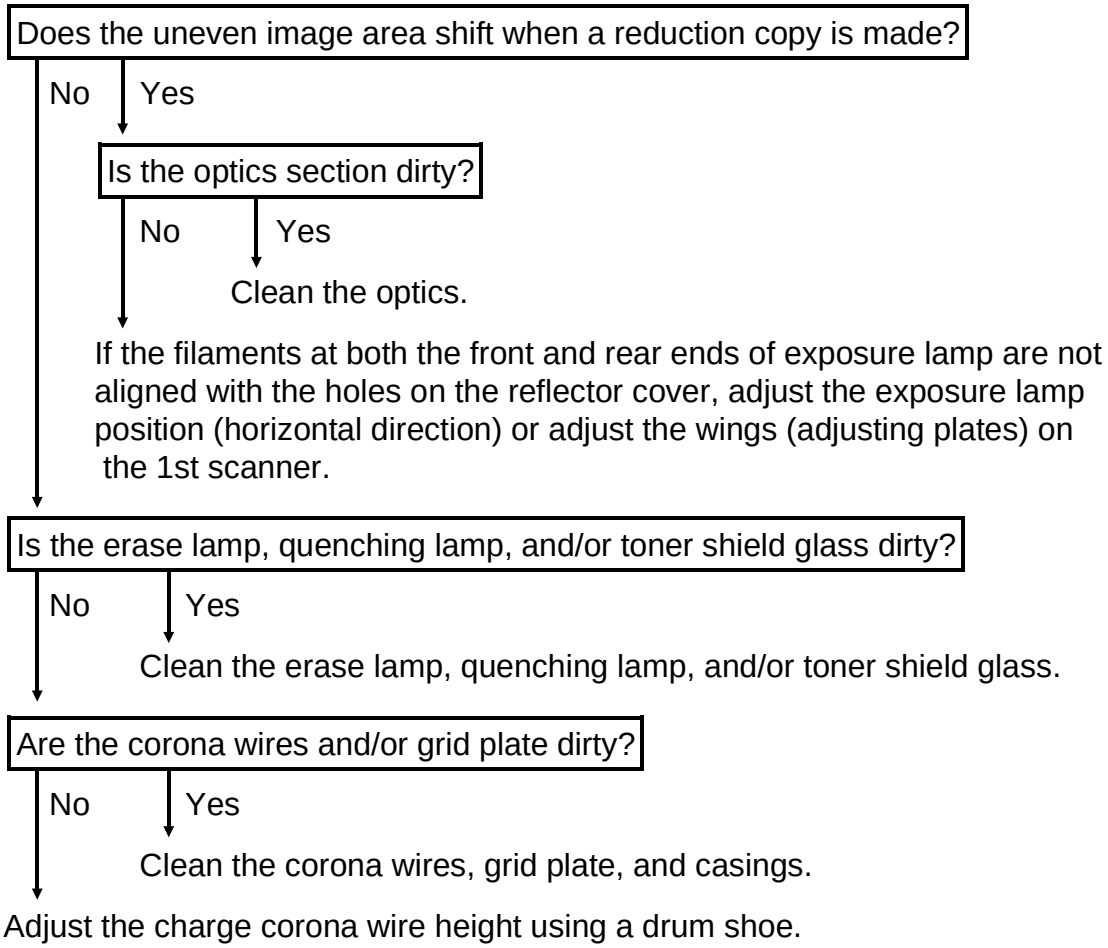
- Symptom -

Uneven image density appears on the copies.

- Possible Cause -

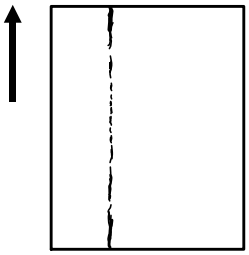
1. Dirty optics
2. Uneven exposure lamp horizontal position.
3. Dirty corona wires or grid
4. Uneven height of charge corona wire.

- Action -


Does the uneven image area shift when a reduction copy is made?
No
Yes
Is the optics section dirty?
No
Yes
Clean the optics.
If the filaments at both the front and rear ends of exposure lamp are not aligned with the holes on the reflector cover, adjust the exposure lamp position (horizontal direction) or adjust the wings (adjusting plates) on the 1st scanner.
Is the erase lamp, quenching lamp, and/or toner shield glass dirty?
No
Yes
Clean the erase lamp, quenching lamp, and/or toner shield glass.
Are the corona wires and/or grid plate dirty?
No
Yes
Clean the corona wires, grid plate, and casings.

Adjust the charge corona wire height using a drum shoe.

1.4 VERTICAL BLACK BANDS



- Symptom -

Vertical black bands appear on the copy paper.

- Possible Causes -

1. Dirty optics
2. Dust between the cleaning blade and drum
3. Edge of the cleaning blade deformed
4. Deformed cleaning brush
5. Deformed inlet seal on the development unit

- Action -

Do the black bands shift when a reduction copy is made?

No ↓

Yes ↓

Check and clean the optics section (including the toner shield glass).

Press the blade release lever down two or three times to clean the edge of the the cleaning blade. If the black bands still appear, go to the next step.

↓

Is the edge of the cleaning blade deformed?

No ↓

Yes ↓

Replace the cleaning blade.

Is the cleaning brush deformed?

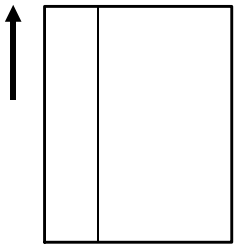
No ↓

Yes ↓

Replace the cleaning brush.

If the inlet seal on the development unit is deformed, replace the inlet seal plate and the seal as a set.

1.5 VERTICAL BLACK LINES



- Symptom -

Thin black lines appear on the copy.

- Possible Causes -

1. Scratched cleaning blade
2. Dirty or scratched exposure glass and/or dirty or scratched mirrors
3. Scratched or dirty drum
4. Scratched hot roller

- Action -

Do the black lines shift when a reduction copy is made?

No

Yes → Clean or replace the exposure glass or mirrors.

Is the toner shield glass scratched?

No

Yes → Replace the toner shield glass.

Is the edge of the cleaning blade scratched?

No

Yes → Replace the cleaning blade.

Is the hot roller scratched?

No

Yes → Check whether black lines appear on the copy by stopping the copy paper in the transport section. If no black lines appear, replace the hot roller.

Check whether the drum is scratched or toner is built-up on the drum.

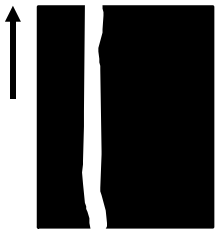
- If toner is built-up on the drum, clean the drum with damp cloth.
- If the drum is scratched, replace the drum.

NOTE: When replacing the drum, perform drum initial setting using SP mode #66.

1.6 VERTICAL WHITE LINES OR BANDS—1 (DULL OR BLURRED)

- Symptom -

Dull or blurred white lines appear on the copy.



- Possible Causes -

1. Dirty or deteriorated charge corona wire.
2. Dirty or deformed grid plate.
3. The inlet seal on the development unit is damp or is contaminated with oil.

- Action -

Is the charge corona wire and/or grid plate dirty?

No

Yes

Clean the charge corona wire and/or grid plate.

Is the inlet seal damp or contaminated with oil?

No

Yes

Clean the inlet seal with a dry cloth. If the problem is not corrected, replace the inlet seal plate and the seal as a set.

Is the grid plate deformed?

No

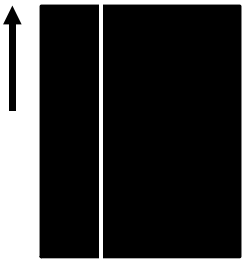
Yes

Replace the grid plate.

Replace the charge corona wire.

1.7 VERTICAL WHITE LINES OR BANDS—2 (THIN, DISTINET)

- Symptom -



Vertical white lines appear on the copy.

- Possible Causes -

1. Paper dust on the edge of cleaning blade
2. Scratched drum
3. Scratched hot roller

- Action -

Press the cleaning blade release lever down several times. Make a copy and if the white lines still occur, go to the next step.

↓

Make a copy and stop the machine when the paper reaches the transport section. Do white lines appear on the copy?

No ↓

Yes → Replace the drum if it is scratched.

Replace the hot roller if it is scratched.

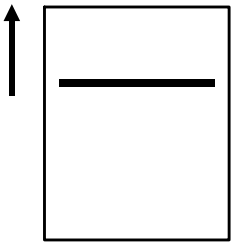
NOTE: If the drum is scratched, find out what caused the scratches on the drum and correct the problem.

- Paper Jam
- Incorrect positioning of the pick-off pawls
- Foreign substances on the cleaning brush and/or blade
- Carrier leakage

When replacing the drum, perform the drum initial setting using SP mode #66.

1.8 HORIZONTAL BLACK/WHITE LINES

- Symptom -



Black/white lines perpendicular to the paper feed direction appear on the copy image.

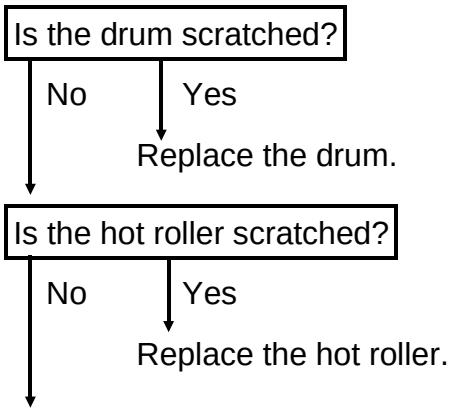
- Possible Causes -

1. Drum is scratched.
   If black lines appear at 251mm intervals, the cause is a scratched drum or toner build up.

2. Hot roller is scratched.
   If black lines appear at 125mm intervals, the cause is a scratched hot roller.

3. Toner adhered to the drum surface.
   Due to insufficient cleaning, foreign matter may be build up on the blade, causing toner to stick to the drum surface when the drum stops.

- Action -



If toner adheres to the drum surface, clean the drum with water. Also clean or replace the cleaning blade and/or cleaning brush.

1.9 JITTER

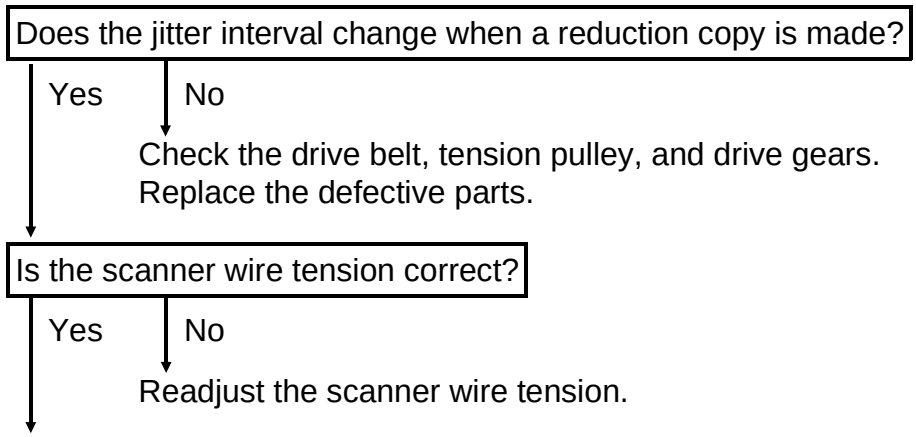
- Symptom -

Jitter appears on the copy.

- Possible Causes -

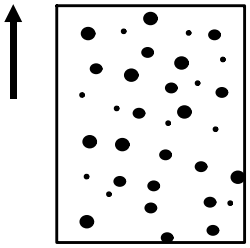
1. Vibration in drive mechanism.
2. Scanner not moving smoothly.

- Action -


Does the jitter interval change when a reduction copy is made?
Yes
No
Check the drive belt, tension pulley, and drive gears.
Replace the defective parts.
Is the scanner wire tension correct?
Yes
No
Readjust the scanner wire tension.
Clean the scanner guide rails and check the scanner drive.

1.10 BLACK SPOTS ON THE COPY IMAGE

- Symptom -



1. The grid voltage is not applied correctly.
   - Poor contact between charge corona casing and grid spring
   - CC/G/B power pack defective
   - Main board defective

- Action -

Is there a good electrical contact between the charge corona casing and the grid spring?

Yes

No → Repair the poor contact and/or replace any parts if needed.

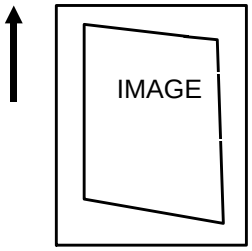
Check the voltage at CN112-1 on the main board.

0V

Not 0V → Replace the main board.

Replace the CC/G/B power pack.

1.11 SKEWED (OPTICAL) COPY IMAGE



- Symptom -

The copy image is skewed (parallelogram shape).

The sides of the copy image are straight, but the leading and trailing edges are skewed.
(This differs from the paper path type of skewing.)

- Possible Causes -

1. 4th/5th mirror assembly is not parallel with the 1st and 2nd scanners.
2. Mirrors are in the wrong position
3. The stubs of the 4th/5th mirror assembly are off the rails.

- Action -

Is each mirror positioned correctly on its scanner and on the 4th/5th mirror assembly?

Yes

No → Reposition the mirror correctly. If the spring plates are defective, replace them.

Are the stubs of the 4th/5th mirror assembly off the rails?

No

Yes → Put the mirror assembly stubs back on the rails.

Readjust the height of 4th/5th mirror assembly by turning the adjusting screw.

1.12 TONER DENSITY TOO HIGH

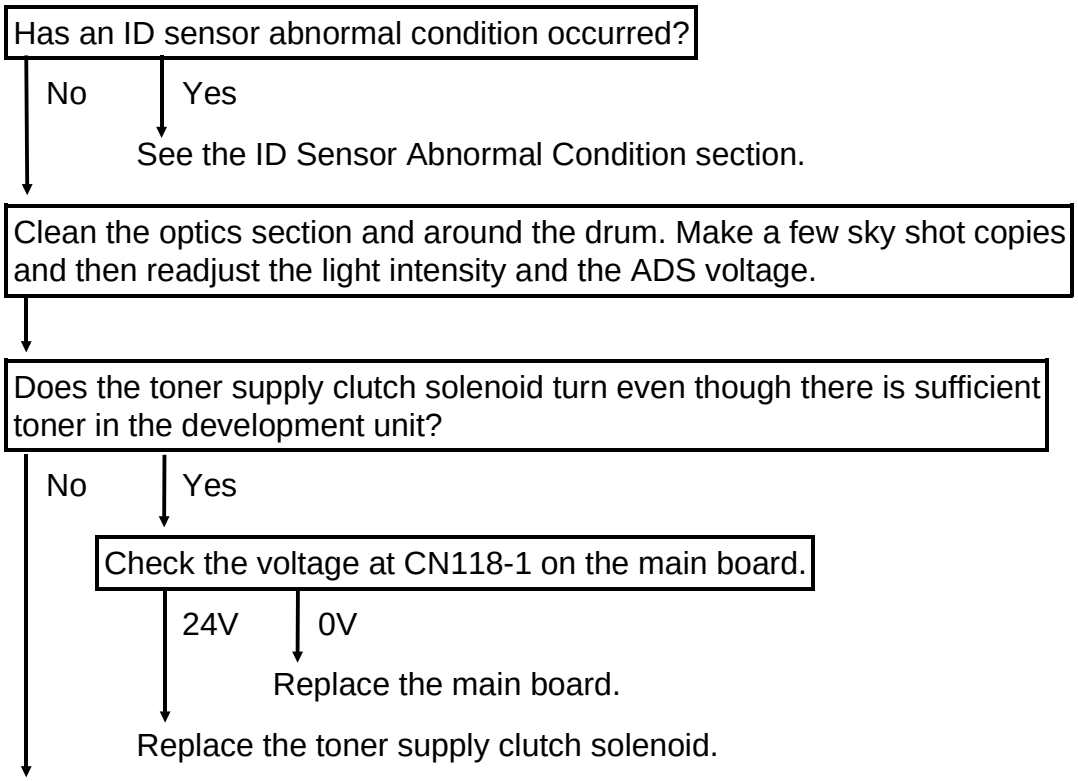
- Symptom -

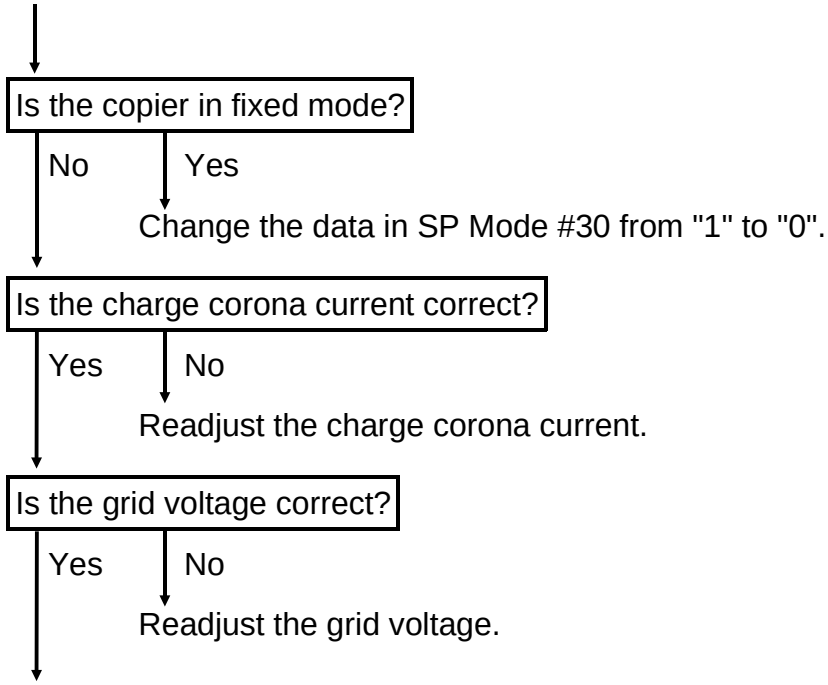
1. Dirty background appears on the copy.
2. The image density of black solid areas is too high.
3. Toner has built up on the endblock cover of the TC/SC corona unit and also on the upper cover of the development unit.

- Possible Causes -

1. Light intensity of the exposure lamp is too high.
2. Toner supply clutch keeps on turning continuously.
3. Copier is in fixed toner supply mode.
4. Main board defective
5. ID sensor bias voltage (modules) is too low.
6. Charge corona current is too low.
7. ID sensor grid voltage is too low.

- Action -


Has an ID sensor abnormal condition occurred?
No
Yes
See the ID Sensor Abnormal Condition section.
Clean the optics section and around the drum. Make a few sky shot copies and then readjust the light intensity and the ADS voltage.
Does the toner supply clutch solenoid turn even though there is sufficient toner in the development unit?
No
Yes
Check the voltage at CN118-1 on the main board.
24V
0V
Replace the main board.
Replace the toner supply clutch solenoid.



Check the data of SP Mode #33. If the data is greater than "2", readjust the data to "0".

1.13 TONER DENSITY TOO LOW

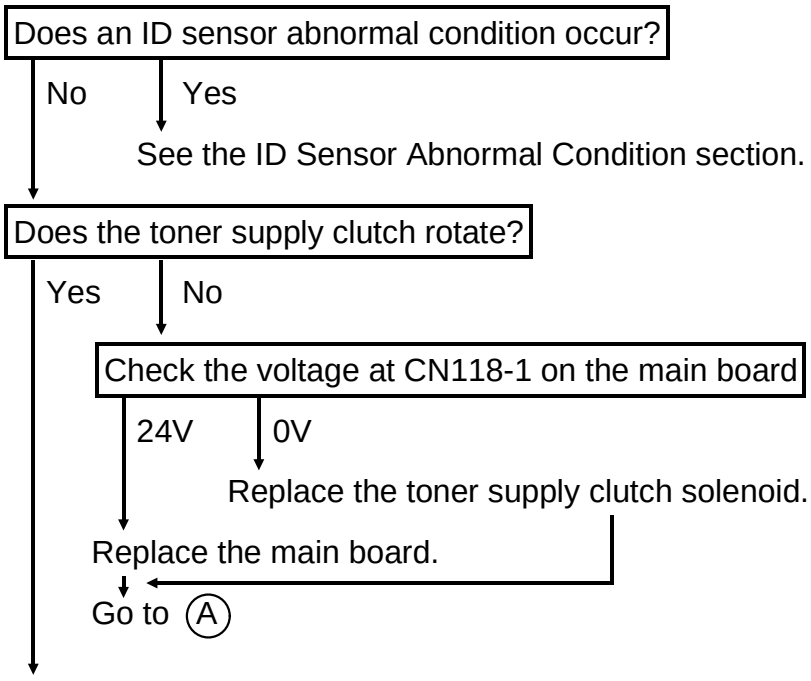
- Symptom -

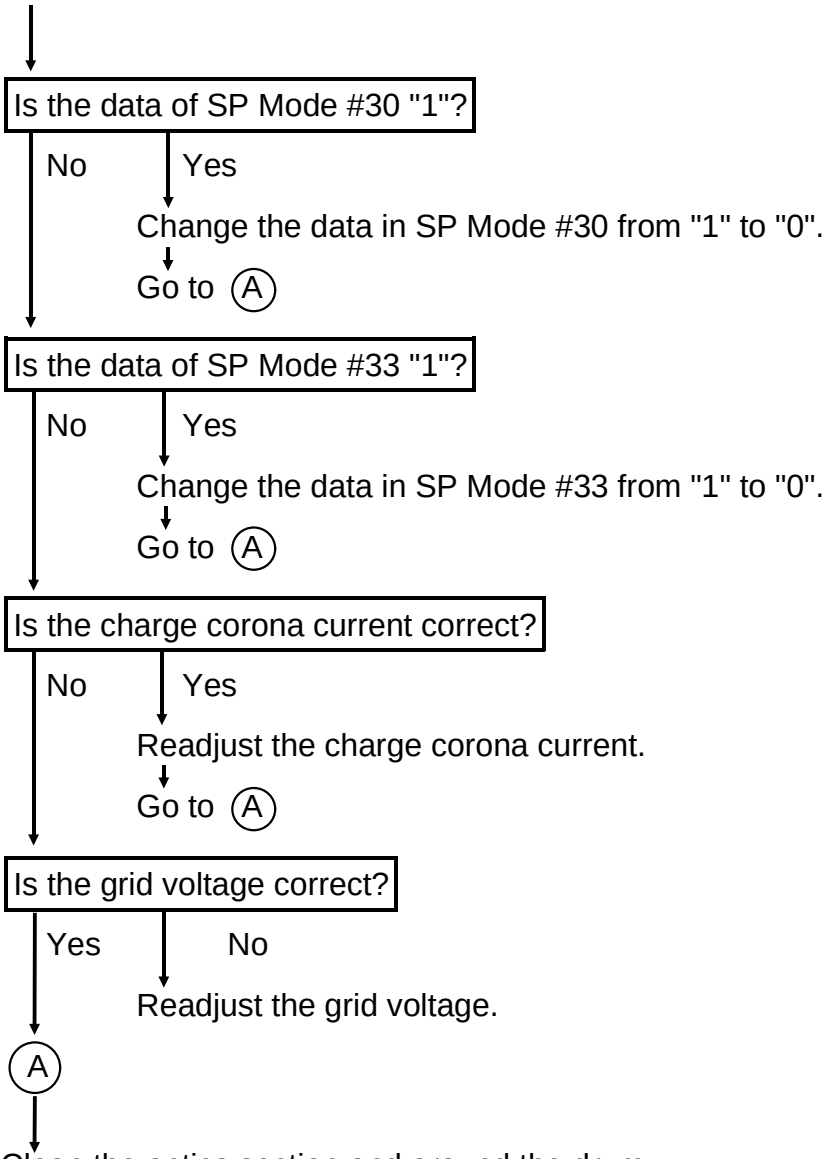
1. Light copy
2. Carrier is on the copy.
3. Light spots appear in black solid areas.

- Possible Causes -

1. Light intensity of the exposure lamp is too low.
2. Toner supply clutch does not rotate.
3. Copier is in the fixed toner supply mode.
4. Main board is defective.
5. ID sensor voltage is too high.
6. Charge corona current is too high.
7. ID sensor grid voltage is too high.

- Action -





Clean the optics section and around the drum.
Turn on DIP switch 101-1 on the main board. Place a few sheets of white paper on the exposure glass. Enter "99" using the numeral key and press the Start key to start free run. Repeat free run until Vsp becomes lower than 1/8 Vsg using SP mode #55.

Adjust the light intensity, ADS voltage, and/or Vsg voltage.

1.14 TONER SCATTERING

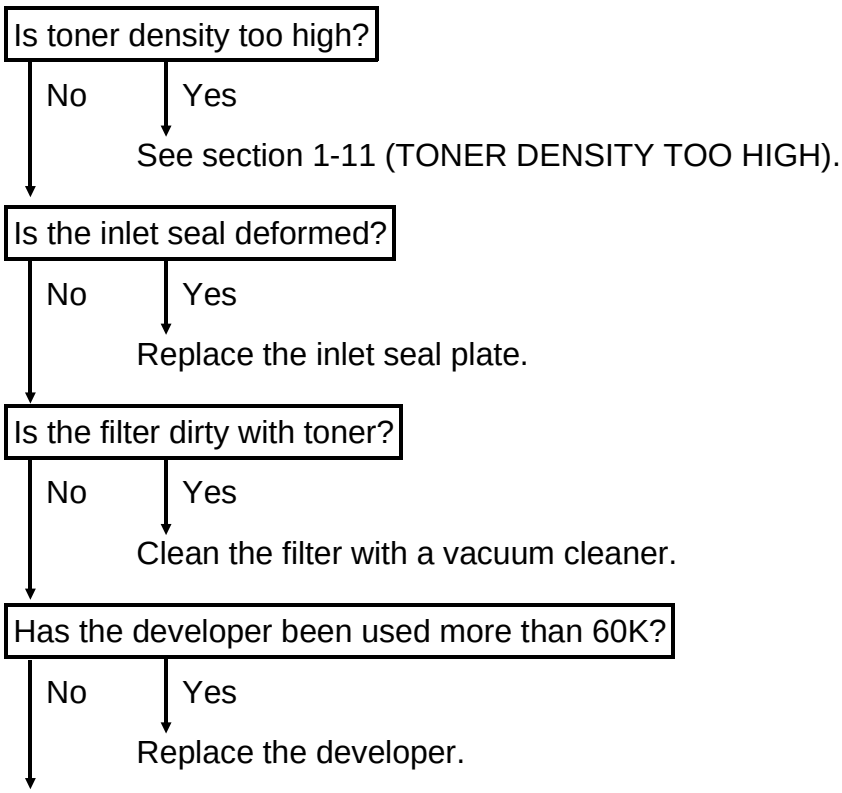
- Symptom -

Toner scatters from the development unit.

- Possible Causes -

1. Toner density is too high.
2. Inlet seal on the development unit is out of position.
3. Filter on the top of the development unit is dirty.
4. Developer deterioration
5. Doctor gap is too wide.

- Action -



Check the doctor gap. If the doctor gap is wider than the adjustment standard, adjust the doctor gap.

1.15 UNFUSED COPY IMAGE

- Symptom -

Solid image rubs off easily.

- Possible Causes -

1. Fusing pressure is too weak.
2. Fusing temperature is too low.
3. Thermistor malfunction

- Action -

Adjust the position of the pressure springs to increase the fusing pressure.

↓ No good

Increase fusing temperature using SP Mode #49.

↓ No good

Check the thermistor. If the thermistor is malfunctioning, replace it.

1.16 PAPER MISFEED

- Symptom -

1. Misfeed location indicator turns on when the main switch is turned on even if there is no paper in the copier.
2. Misfeed location indicator always turns on at the same location when copies are made.

- Possible Causes -

1. Sensor is defective.
2. Mechanical and/or electrical malfunction

- Action 1 (Initial Misfeed) -

Check which sensor is defective using the Initial Misfeed Table. (See page 4-33.) Replace the defective sensor. If no sensors are defective, replace the main board.

- Action 2 (Misfeed during copy cycle) -

Set jam Detection OFF mode (SP mode #6) to on and make a copy to see whether a misfeed occurs.

Misfeed

No misfeed

Check which sensor is defective using the Misfeed During Copy Cycle table. (See page 4-33.) If no sensors are not defective, replace the main board.

Check whether a mechanical or electrical malfunction occurs. Replace the defective parts.

1.17 DF ORIGINAL MISFEED OR SKEW

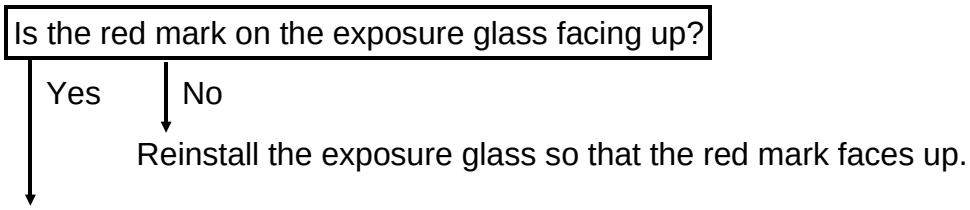
- Symptom -

When the DF is in use, the original stops on the exposure glass or is skewed even if the electrical components are functioning normally.

- Possible Causes -

1. Exposure glass is upside-down.
2. Friction between the exposure glass and the feed belt

- Action -



Clean the exposure glass surface with alcohol or water. Pour a small amount of silicone oil on the exposure glass and wipe the exposure glass with a dry cloth to reduce the friction between the exposure glass and the feed belt.

2. SERVICE CALL CONDITION

2.1 CODE #11 — EXPOSURE LAMP ERROR

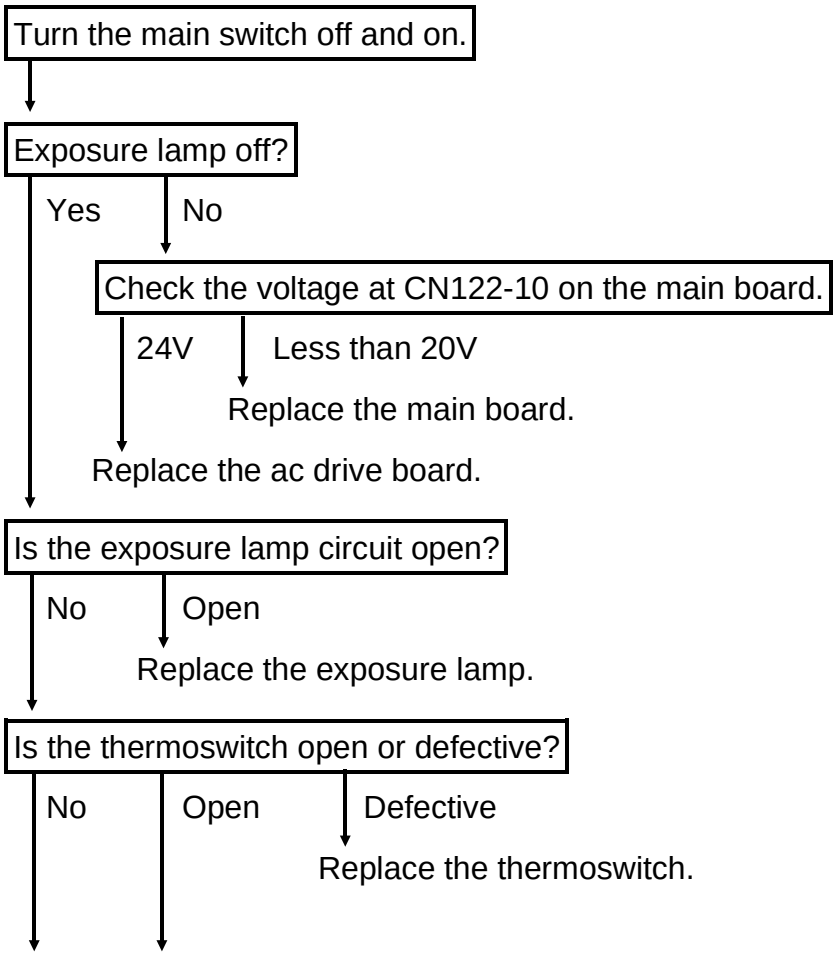
- Definition -

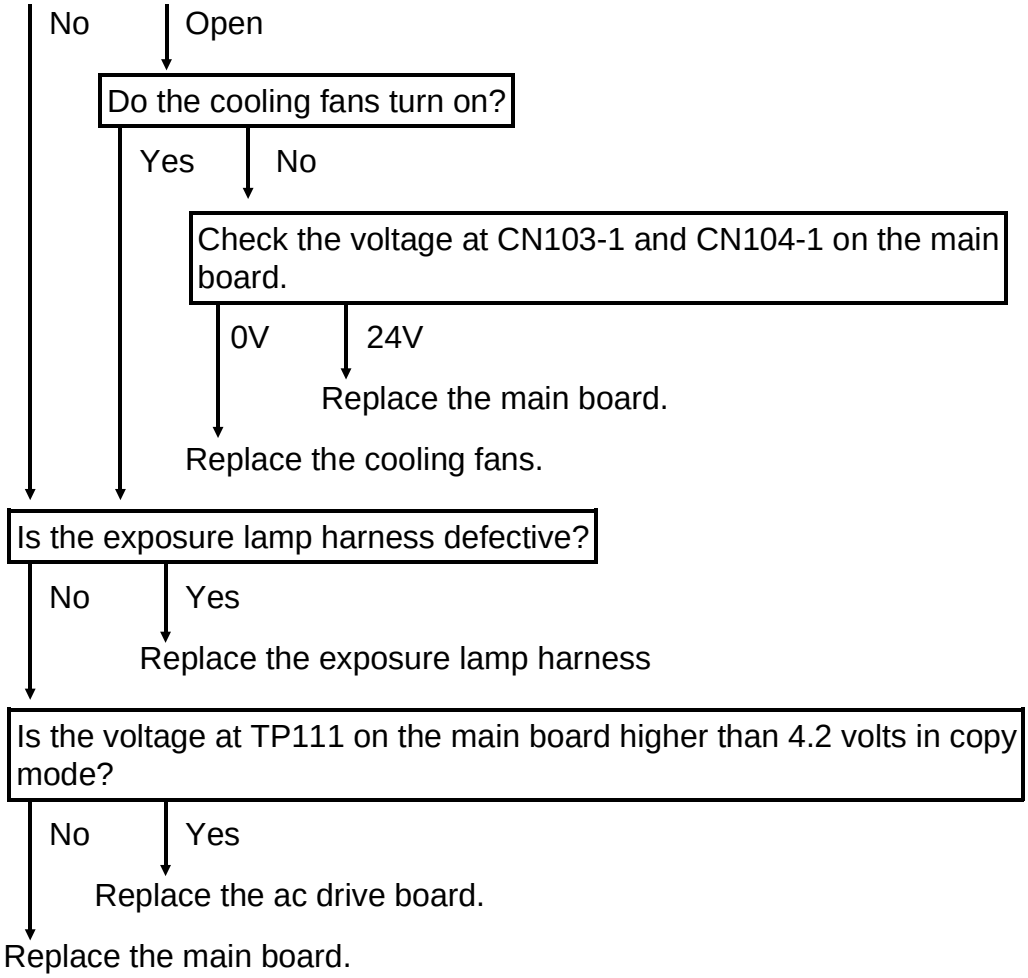
- The feedback signal becomes higher than 4.2 volts (r.m.s.) for 1.0 second when the exposure lamp is on.
- The feedback signal becomes higher than 1.0 volt (r.m.s.) for 1.0 second when the exposure lamp is off.

- Possible Causes -

- Exposure lamp open
- Thermoswitch open
- AC drive board defective
- Main board defective
- DC harness defective

- Action -




No
Open
Do the cooling fans turn on?
Yes
No
Check the voltage at CN103-1 and CN104-1 on the main board.
0V
24V
Replace the main board.
Replace the cooling fans.
Is the exposure lamp harness defective?
No
Yes
Replace the exposure lamp harness
Is the voltage at TP111 on the main board higher than 4.2 volts in copy mode?
No
Yes
Replace the ac drive board.
Replace the main board.

2.2 CODE #12 — EXPOSURE LAMP ERROR

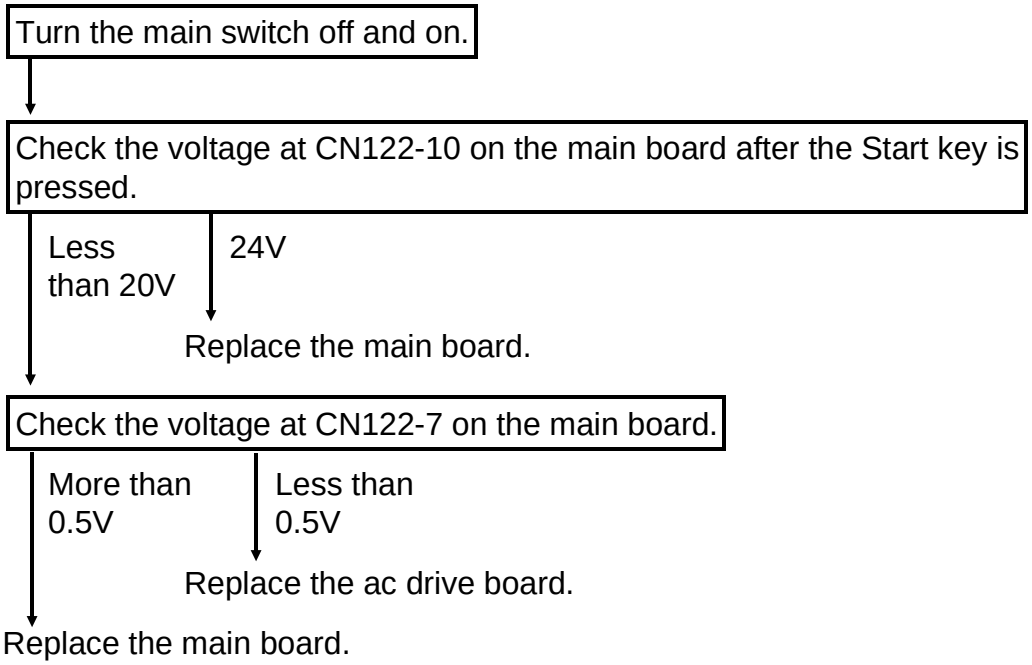
- Definition -

- The feedback signal falls below 0.5 volt (r.m.s.) for 1.0 second when the exposure lamp is on.
- The exposure stays on for longer than 10 seconds.

- Possible Causes -

- AC drive board defective
- Main board defective
- DC harness defective

- Action -


Turn the main switch off and on.
Check the voltage at CN122-10 on the main board after the Start key is pressed.
Less than 20V
24V
Replace the main board.
Check the voltage at CN122-7 on the main board.
More than 0.5V
Less than 0.5V
Replace the ac drive board.
Replace the main board.

2.3 CODE #13 — ZERO CROSS SIGNAL ERROR

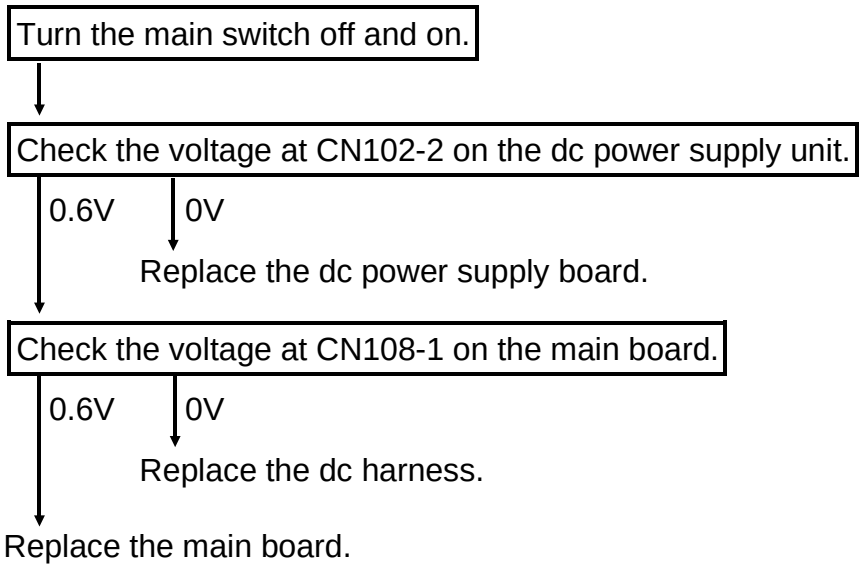
- Definition -

The CPU does not receive the zero cross signal within 0.56 second.

- Possible Causes -

- Main board defective
- DC power supply board
- Zero cross line open

- Action -


Turn the main switch off and on.
Check the voltage at CN102-2 on the dc power supply unit.
0.6V
0V
Replace the dc power supply board.
Check the voltage at CN108-1 on the main board.
0.6V
0V
Replace the dc harness.
Replace the main board.

2.4 CODE #21 — SCANNER HOME POSITION ERROR

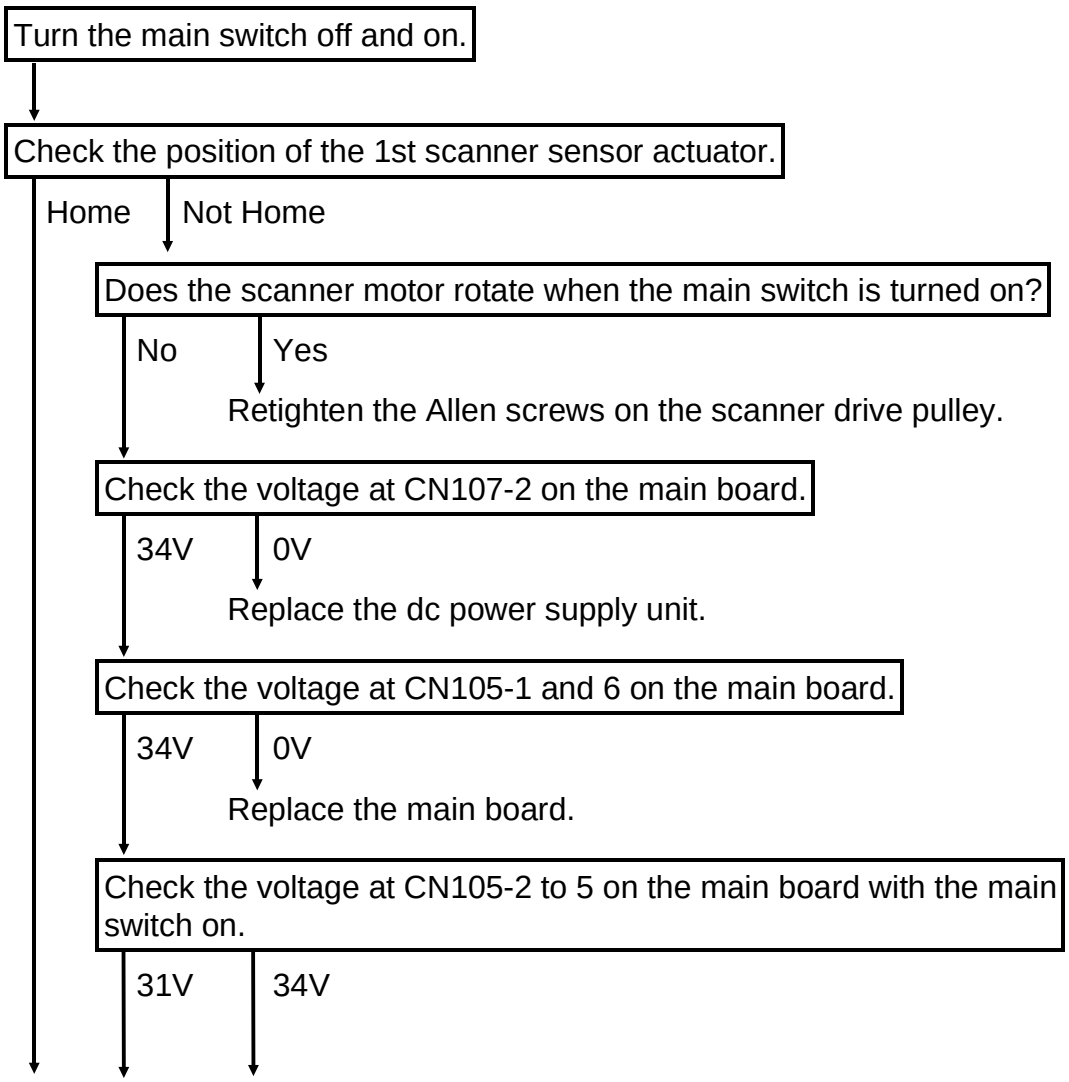
- Definition -

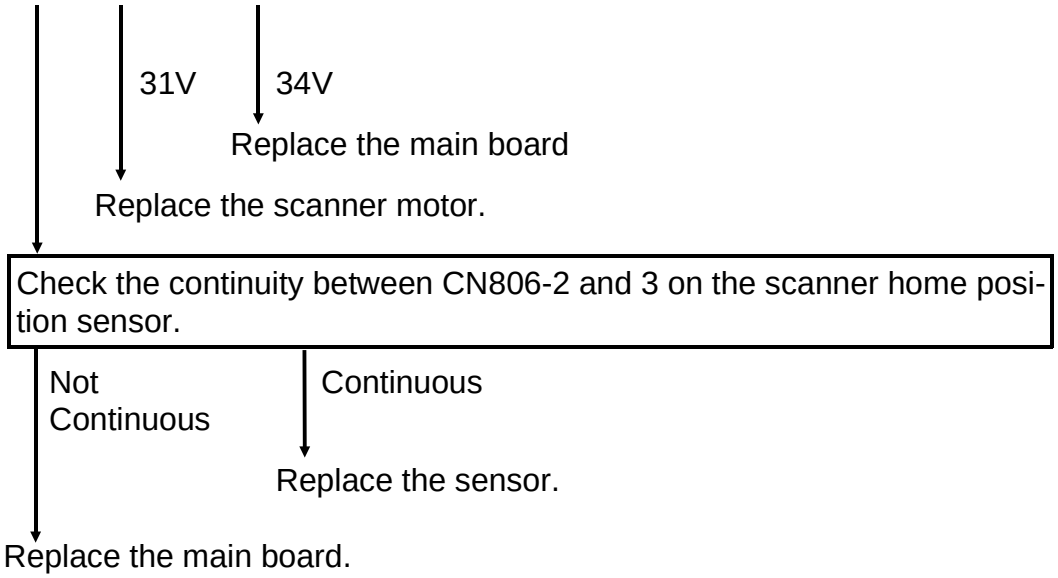
The scanner home position sensor remains off (LOW) 8 seconds after the main switch is turned on.

- Possible Causes -

- Scanner home position sensor short
- Scanner motor defect
- Main board defect
- DC power supply unit defect

- Action -


Turn the main switch off and on.
Check the position of the 1st scanner sensor actuator.
Home
Not Home
Does the scanner motor rotate when the main switch is turned on?
No
Yes
Retighten the Allen screws on the scanner drive pulley.
Check the voltage at CN107-2 on the main board.
34V
0V
Replace the dc power supply unit.
Check the voltage at CN105-1 and 6 on the main board.
34V
0V
Replace the main board.
Check the voltage at CN105-2 to 5 on the main board with the main switch on.
31V
34V


31V
34V
Replace the main board
Replace the scanner motor.
Check the continuity between CN806-2 and 3 on the scanner home position sensor.
Not Continuous
Continuous
Replace the sensor.
Replace the main board.

2.5 CODE #22 — SCANNER HOME POSITION ERROR

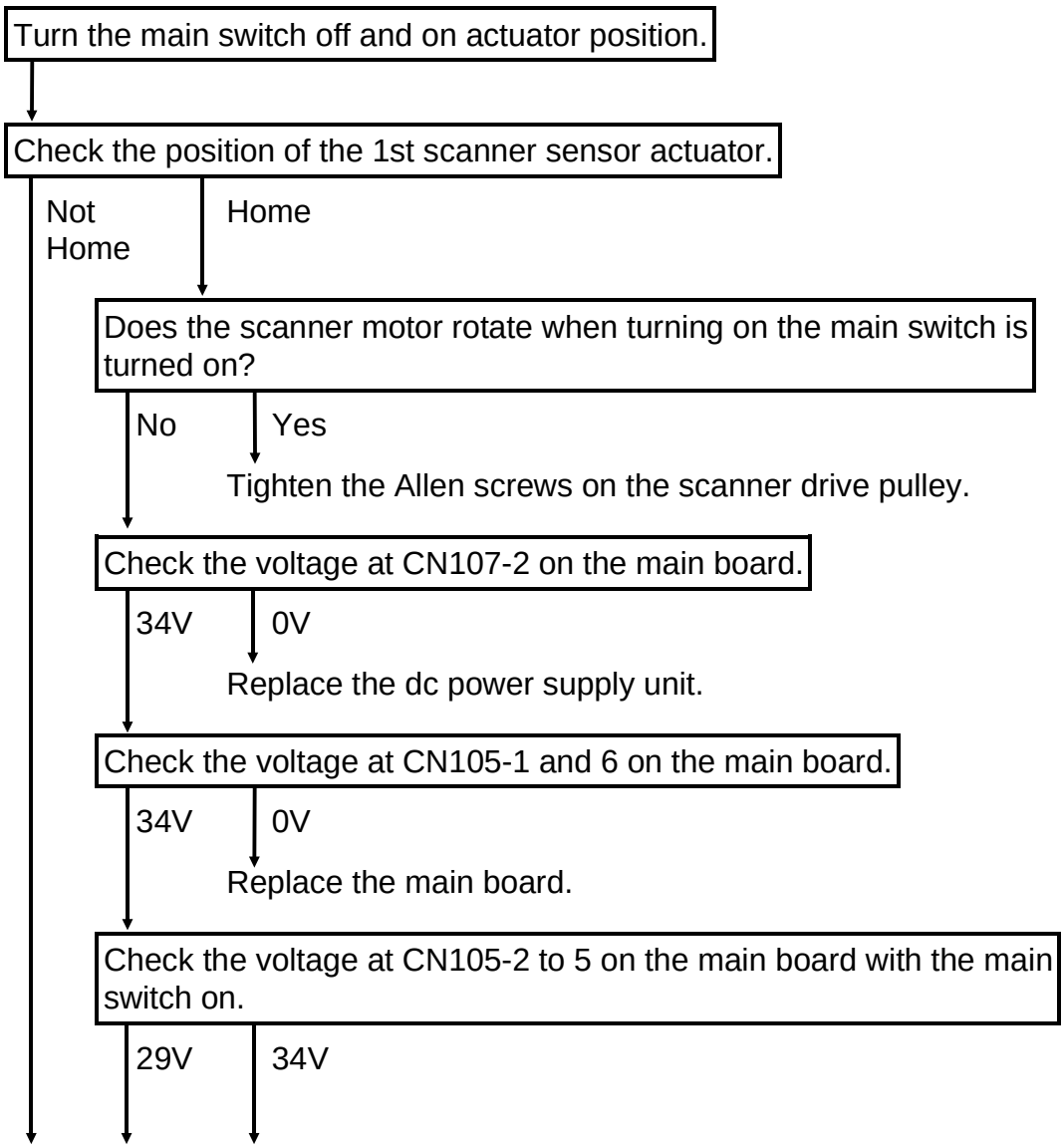
- Definition -

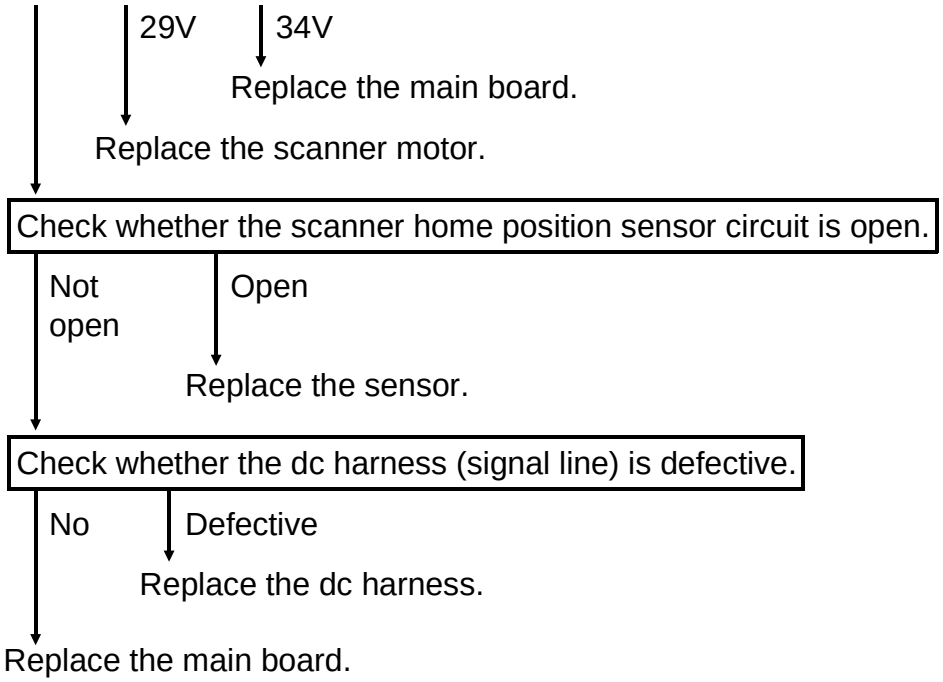
The scanner home position sensor remains on (HIGH) 1.0 second after the scanner starts.

- Possible Causes -

- Scanner home position sensor circuit open
- Scanner motor defective
- Main Motor defective
- DC power supply unit defective

- Action -


Turn the main switch off and on actuator position.
Check the position of the 1st scanner sensor actuator.
Not Home
Home
Does the scanner motor rotate when turning on the main switch is turned on?
No
Yes
Tighten the Allen screws on the scanner drive pulley.
Check the voltage at CN107-2 on the main board.
34V
0V
Replace the dc power supply unit.
Check the voltage at CN105-1 and 6 on the main board.
34V
0V
Replace the main board.
Check the voltage at CN105-2 to 5 on the main board with the main switch on.
29V
34V


29V
34V
Replace the main board.
Replace the scanner motor.
Check whether the scanner home position sensor circuit is open.
Not open
Open
Replace the sensor.
Check whether the dc harness (signal line) is defective.
No
Defective
Replace the dc harness.
Replace the main board.

2.6 CODE #28 — LENS HOME POSITION ERROR

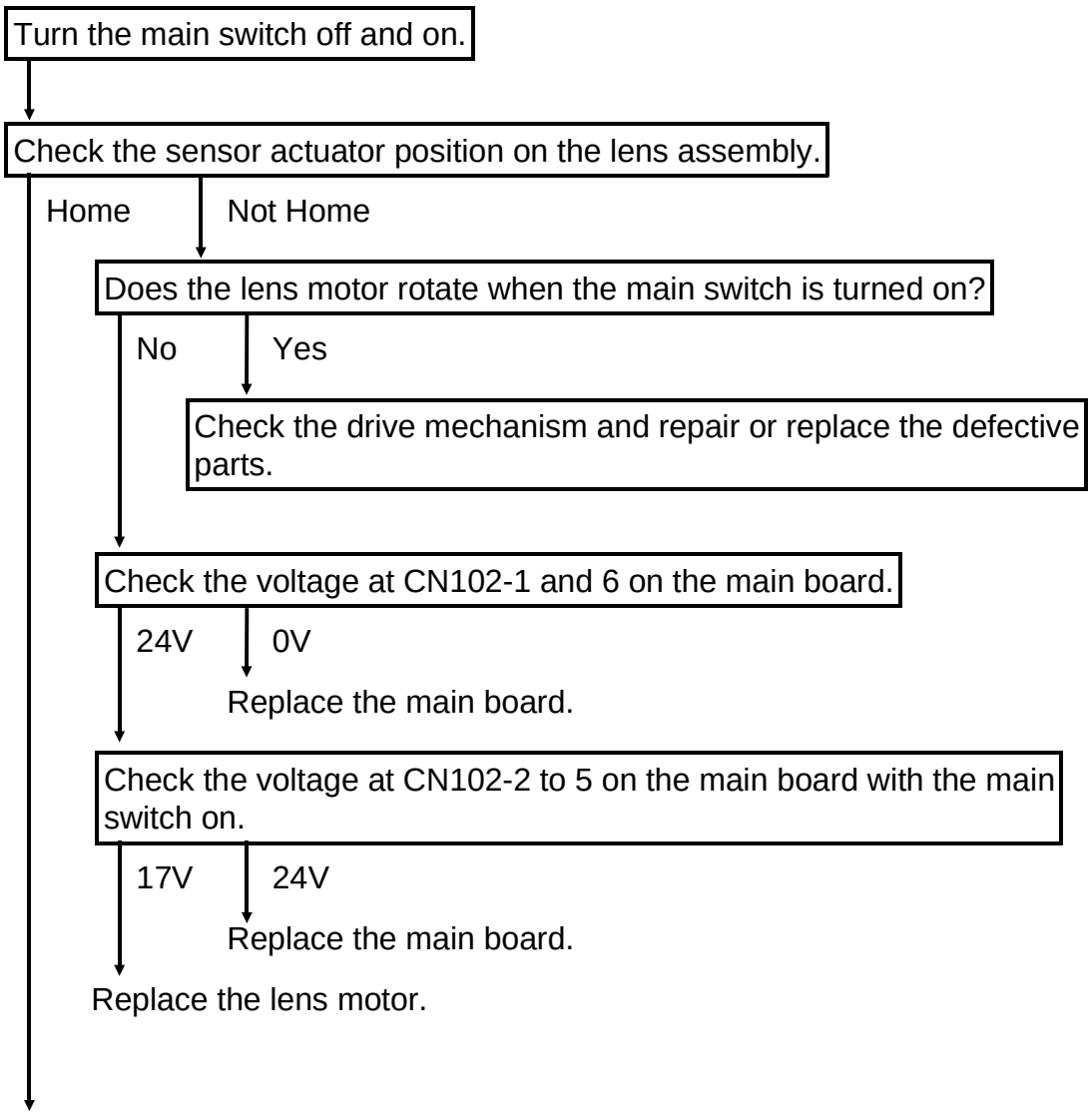
- Definition -

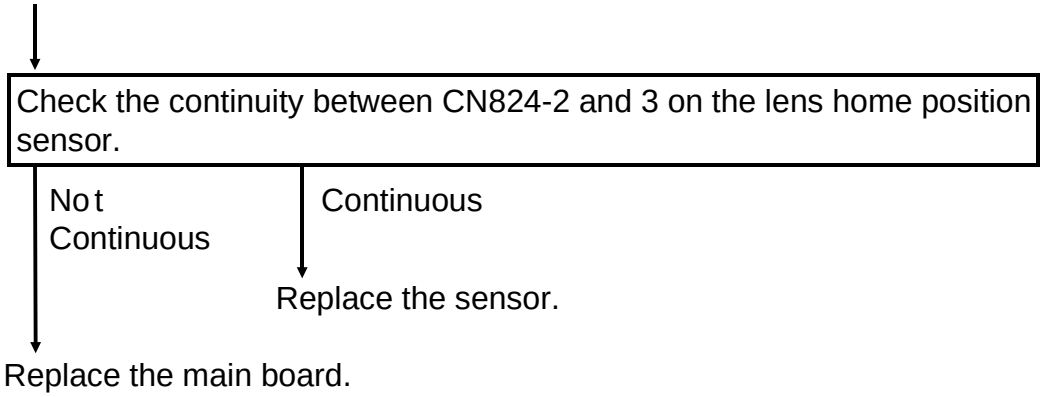
The lens home position sensor remains off (LOW) 3.5 seconds after the lens moves to the home position.

- Possible Causes -

- Lens home position sensor short
- Lens drive motor defect
- Main board defect

- Action -


Turn the main switch off and on.
Check the sensor actuator position on the lens assembly.
Home
Not Home
Does the lens motor rotate when the main switch is turned on?
No
Yes
Check the drive mechanism and repair or replace the defective parts.
Check the voltage at CN102-1 and 6 on the main board.
24V
0V
Replace the main board.
Check the voltage at CN102-2 to 5 on the main board with the main switch on.
17V
24V
Replace the main board.
Replace the lens motor.


Check the continuity between CN824-2 and 3 on the lens home position sensor.
Not Continuous
Continuous
Replace the sensor.
Replace the main board.

2.7 CODE #29 — LENS HOME POSITION ERROR

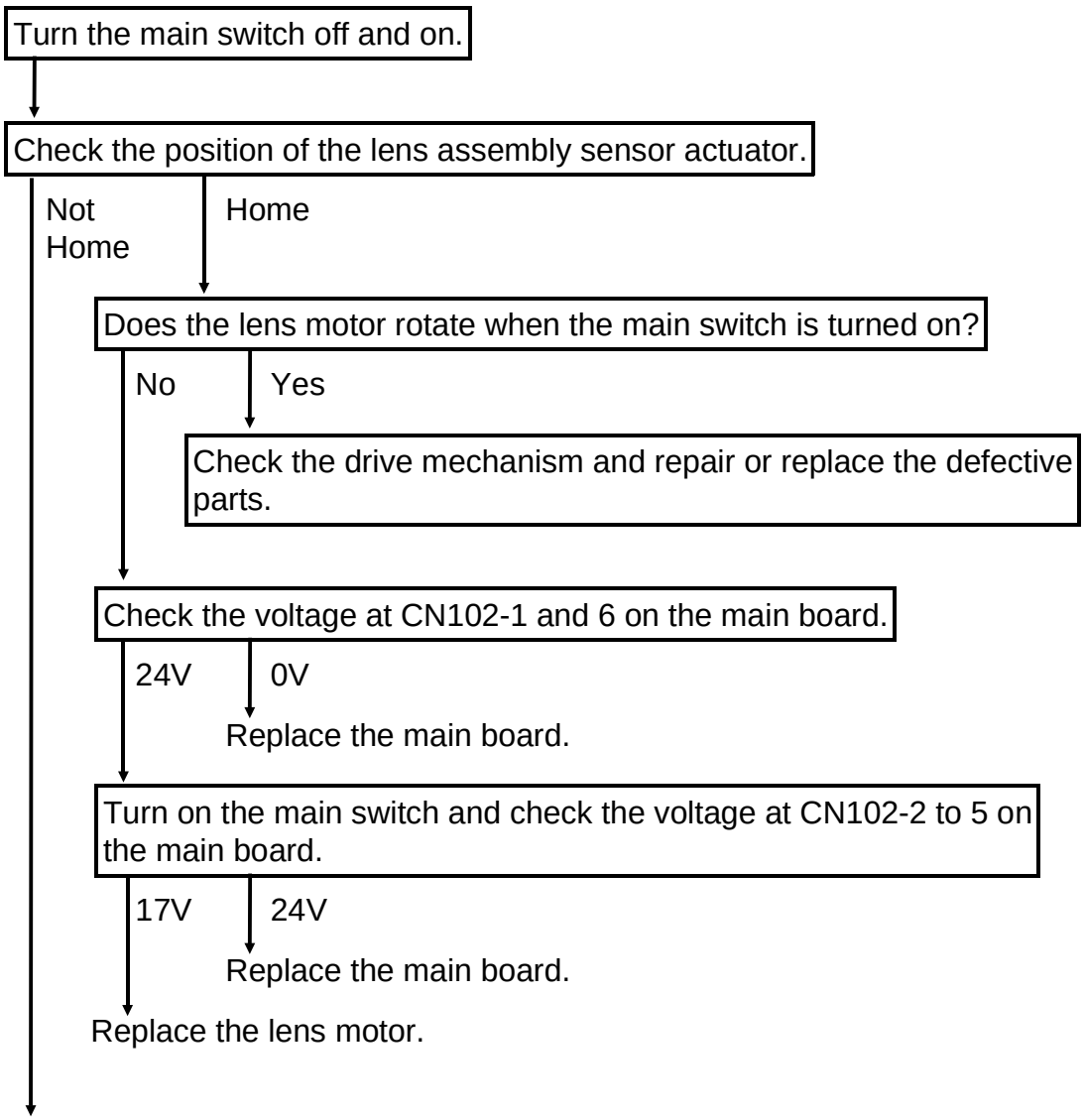
- Definition -

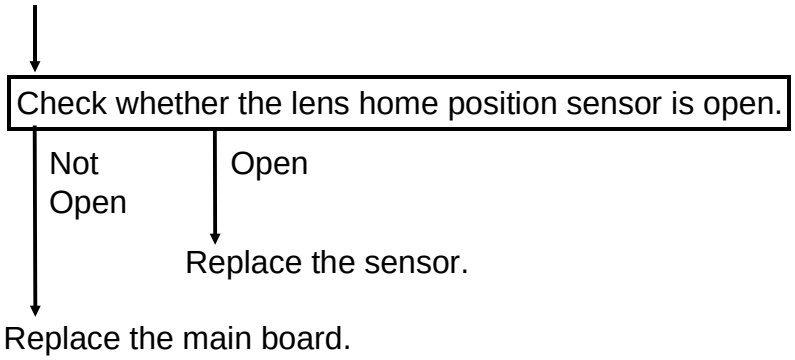
The lens home position sensor is still on (HIGH) 3.5 seconds after the lens leaves the home position.

- Possible Causes -

- Lens home position sensor open
- Lens drive motor defective
- Main board defective

- Action -


Turn the main switch off and on.
Check the position of the lens assembly sensor actuator.
Not Home
Home
Does the lens motor rotate when the main switch is turned on?
No
Yes
Check the drive mechanism and repair or replace the defective parts.
Check the voltage at CN102-1 and 6 on the main board.
24V
0V
Replace the main board.
Turn on the main switch and check the voltage at CN102-2 to 5 on the main board.
17V
24V
Replace the main board.
Replace the lens motor.


Check whether the lens home position sensor is open.
Not Open
Open
Replace the sensor.
Replace the main board.

2.8 CODE #2A — 4TH/5TH MIRROR HOME POSITION ERROR

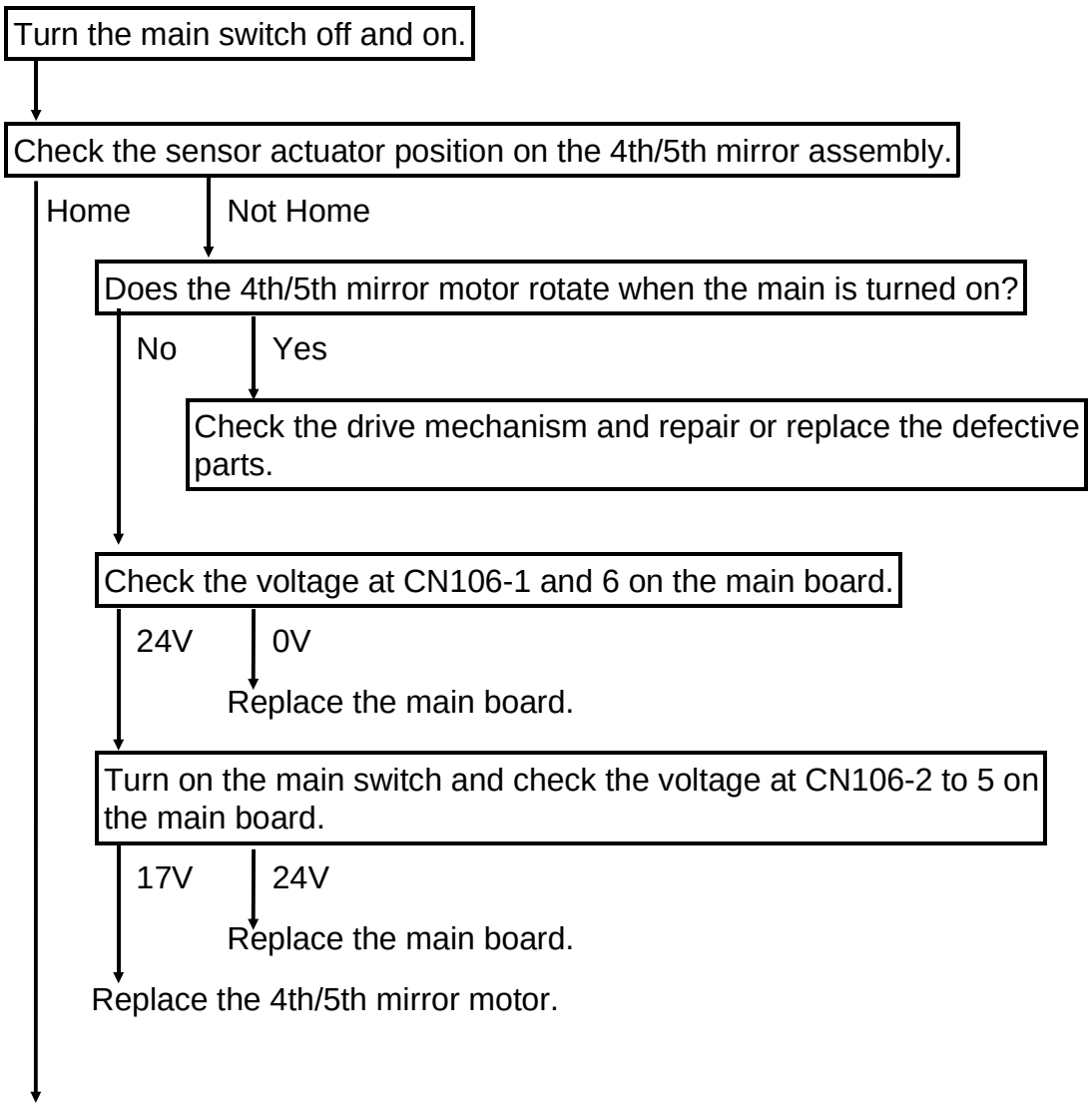
- Definition -

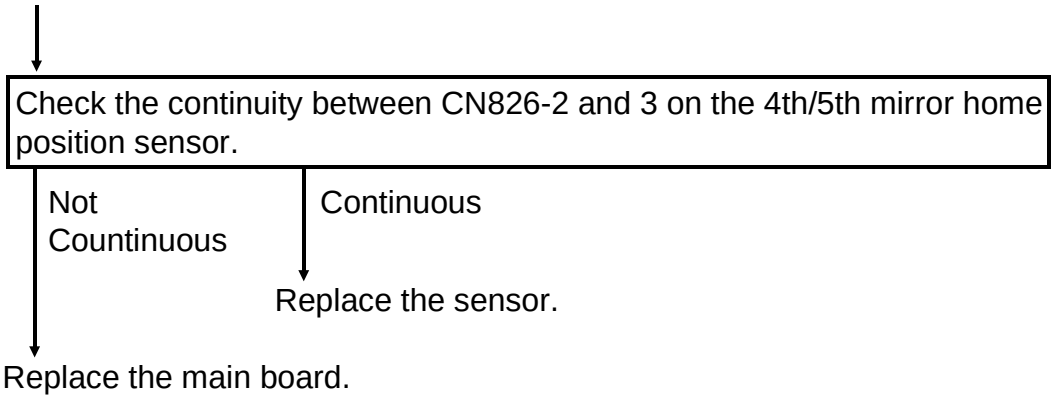
The 4th/5th mirror home position sensor is still off (LOW) 2.5 seconds after the 4th/5th mirror assembly moves to the home position.

- Possible Causes -

- 4th/5th mirror home position sensor short
- 4th/5th mirror motor defect
- Main board defect

- Action -


Turn the main switch off and on.
Check the sensor actuator position on the 4th/5th mirror assembly.
Home
Not Home
Does the 4th/5th mirror motor rotate when the main is turned on?
No
Yes
Check the drive mechanism and repair or replace the defective parts.
Check the voltage at CN106-1 and 6 on the main board.
24V
0V
Replace the main board.
Turn on the main switch and check the voltage at CN106-2 to 5 on the main board.
17V
24V
Replace the main board.
Replace the 4th/5th mirror motor.


Check the continuity between CN826-2 and 3 on the 4th/5th mirror home position sensor.
Not Countinuous
Continuous
Replace the sensor.
Replace the main board.

2.9 CODE #2B — 4TH/5TH MIRROR HOME POSITION ERROR

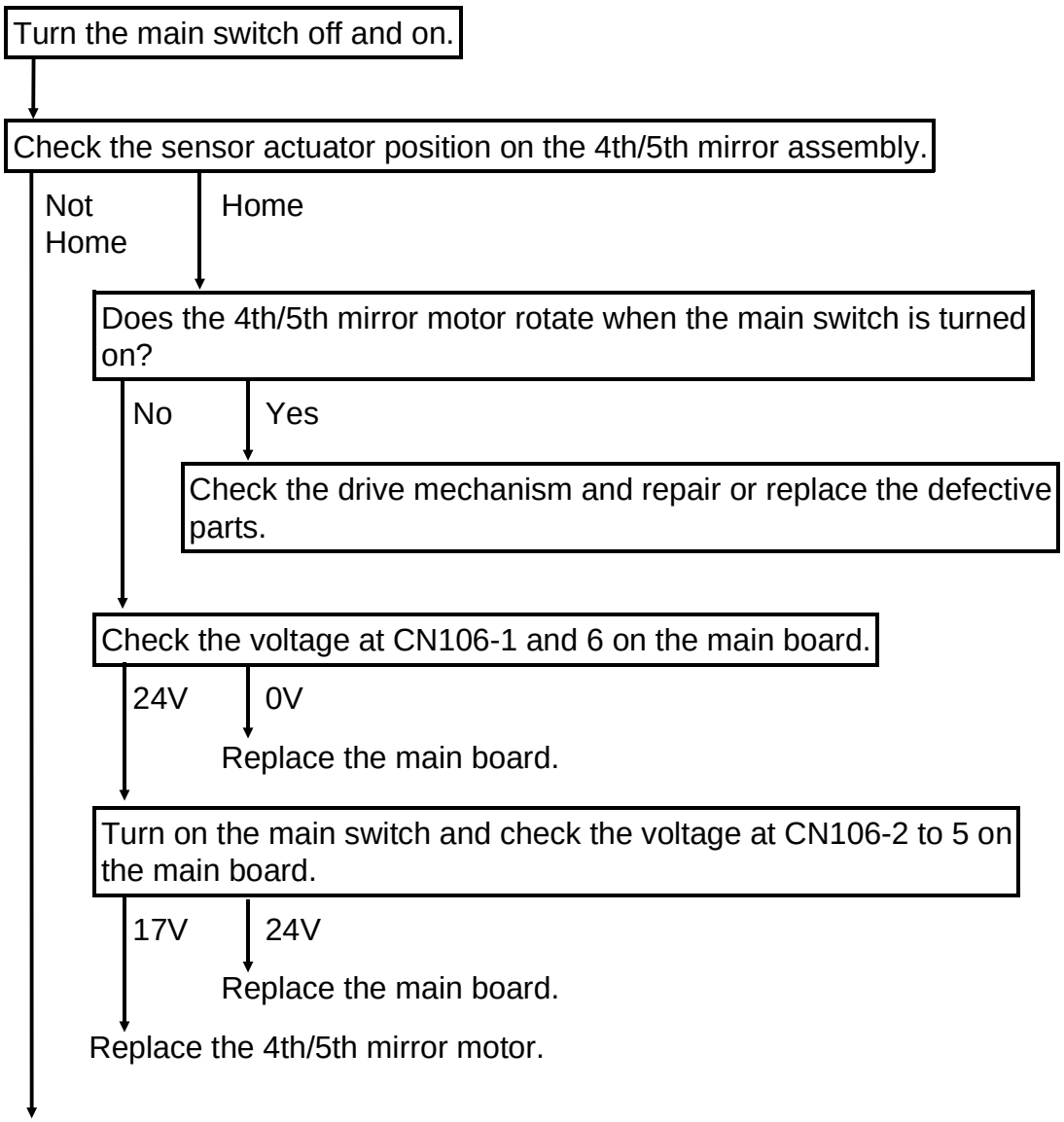
- Definition -

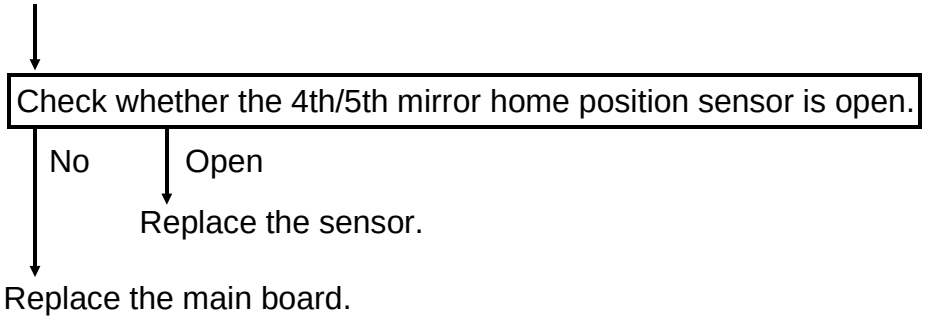
The 4th/5th mirror home position sensor is still on (HIGH) 2.5 seconds after the 4th/5th mirror assembly leaves the home position.

- Possible Causes -

- 4th/5th mirror home position sensor open
- 4th/5th mirror motor defective
- Main board defective

- Action -


Turn the main switch off and on.
Check the sensor actuator position on the 4th/5th mirror assembly.
Not Home
Home
Does the 4th/5th mirror motor rotate when the main switch is turned on?
No
Yes
Check the drive mechanism and repair or replace the defective parts.
Check the voltage at CN106-1 and 6 on the main board.
24V
0V
Replace the main board.
Turn on the main switch and check the voltage at CN106-2 to 5 on the main board.
17V
24V
Replace the main board.
Replace the 4th/5th mirror motor.


Check whether the 4th/5th mirror home position sensor is open.
No
Open
Replace the sensor.
Replace the main board.

2.10 CODE #52 — FUSING WARM-UP ERROR

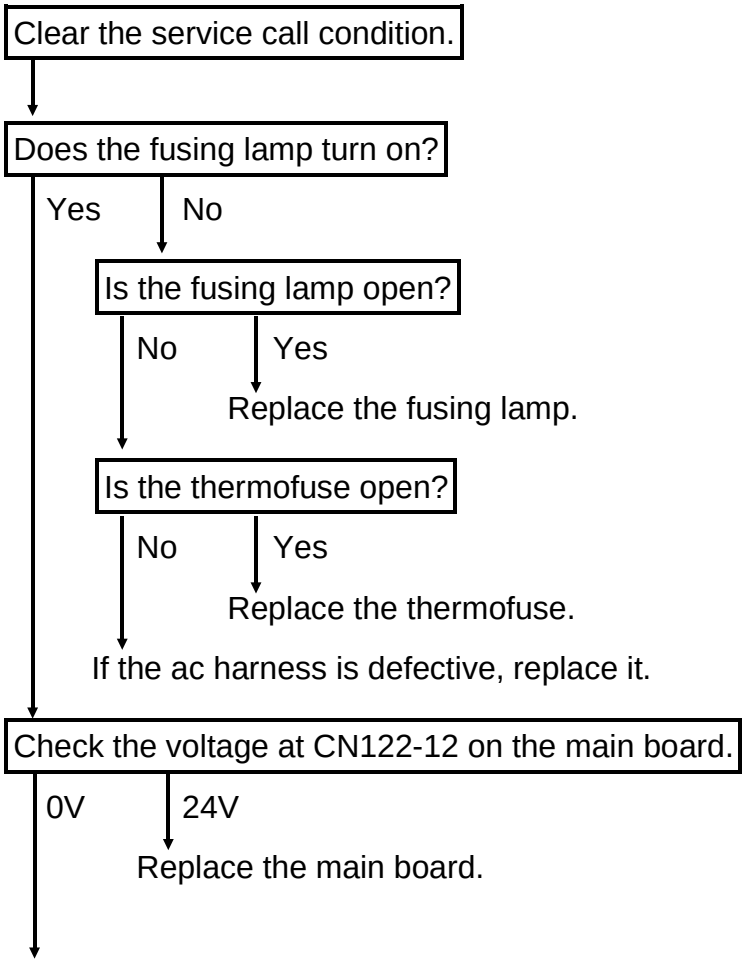
- Definition -

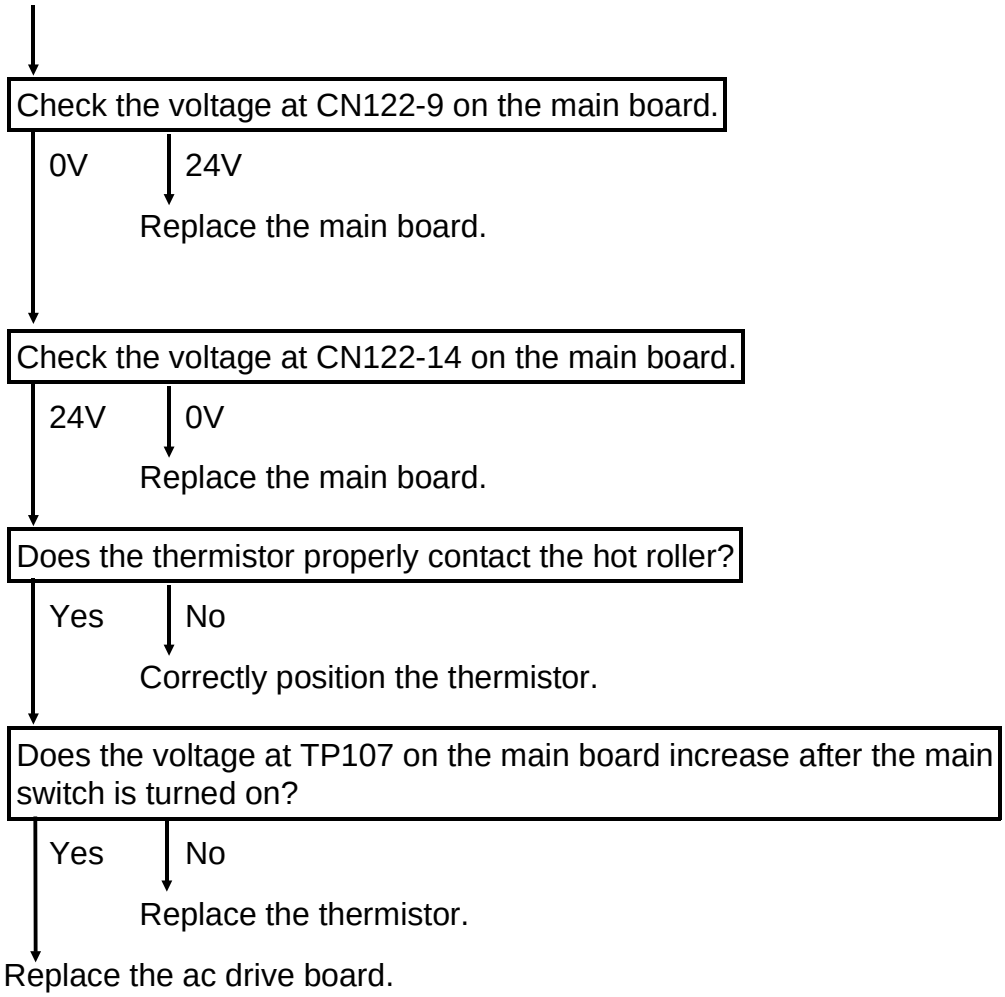
The temperature detected by the thermistor does not reach 175°C within 100 seconds after the main switch is turned on.

- Possible Causes -

- Thermistor position error
- Fusing lamp open
- Thermofuse open
- AC drive board defective
- Main board defective

- Action -




Check the voltage at CN122-9 on the main board.
0V
24V
Replace the main board.
Check the voltage at CN122-14 on the main board.
24V
0V
Replace the main board.
Does the thermistor properly contact the hot roller?
Yes
No
Correctly position the thermistor.
Does the voltage at TP107 on the main board increase after the main switch is turned on?
Yes
No
Replace the thermistor.
Replace the ac drive board.

2.11 CODE #53 — FUSING OVERHEAT

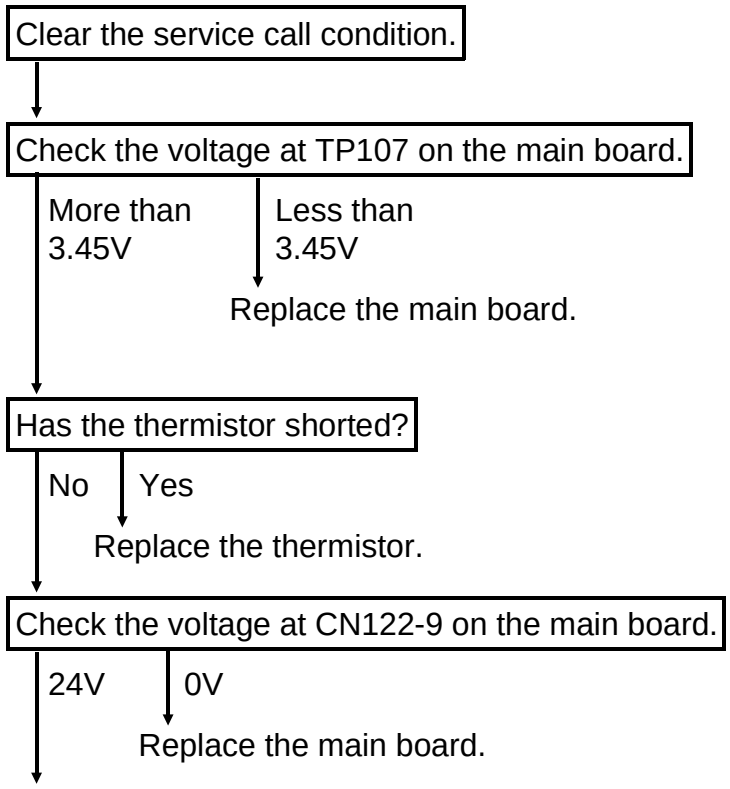
- Definition -

The thermistor detects a temperature higher than 240°C.

- Possible Causes -

- Thermistor short
- AC drive board defect
- Main board defect

- Action -



2.12 CODE #55 — FUSING THERMISTOR OPEN

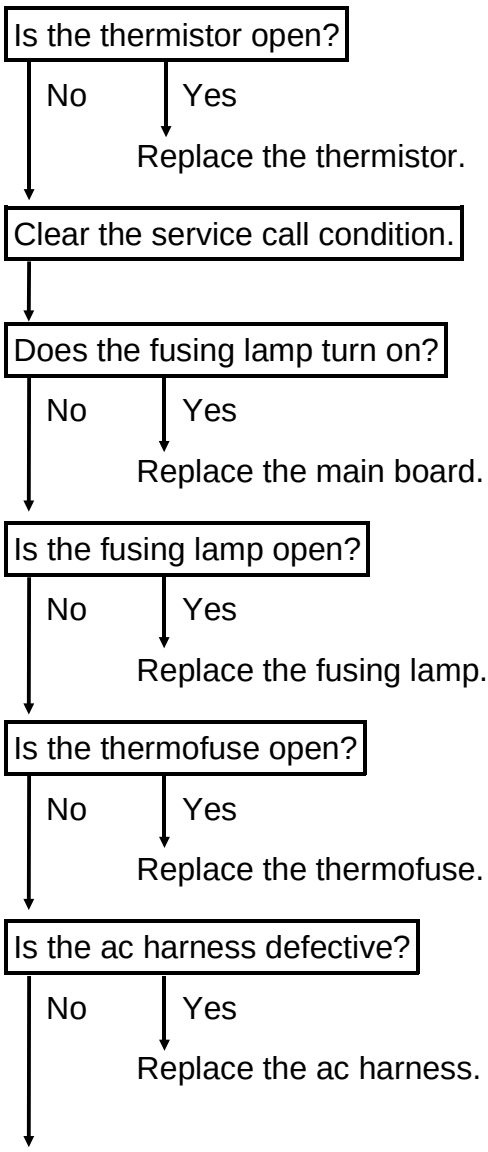
- Definition -

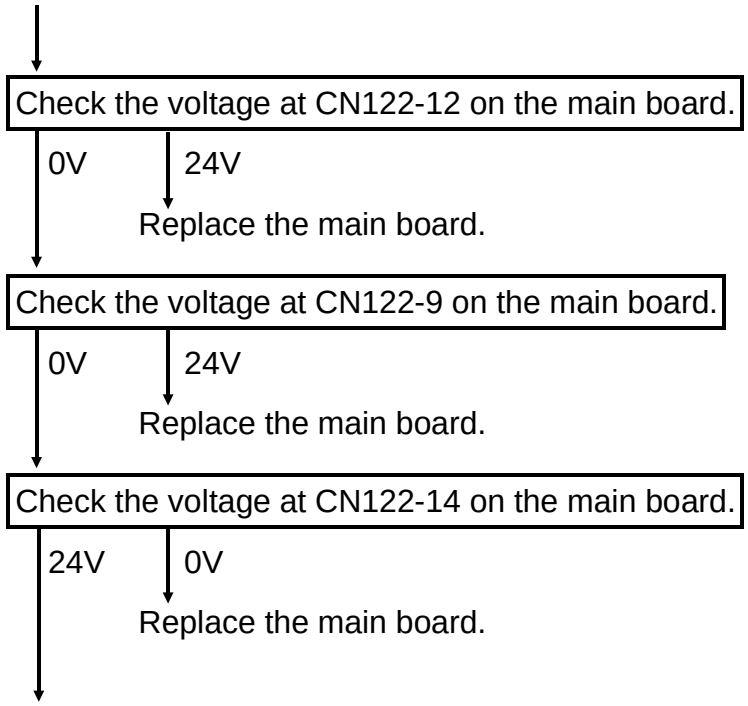
The thermistor does not detect 2°C within 30 seconds after the main switch is turned on.

- Possible Causes -

- Thermistor open
- Main board defective
- Fusing lamp open
- Thermofuse open

- Action -





Replace the ac drive board.

2.13 E70 (IN THE MAGNIFICATION INDICATOR) — TONER OVERFLOW SENSOR ON

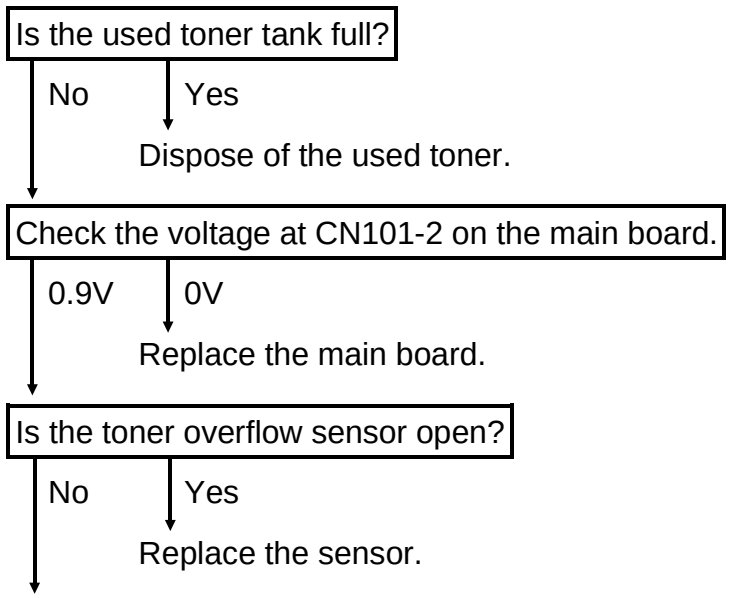
- Definition -

Toner overflow sensor turns on

- Possible Causes -

- Toner overflow
- Toner overflow sensor open
- Main board defective

- Action -



Replace the main board.

2.14 CODE #80 — DUPLEX AND COPIER BOARD COMMUNICATION ERROR

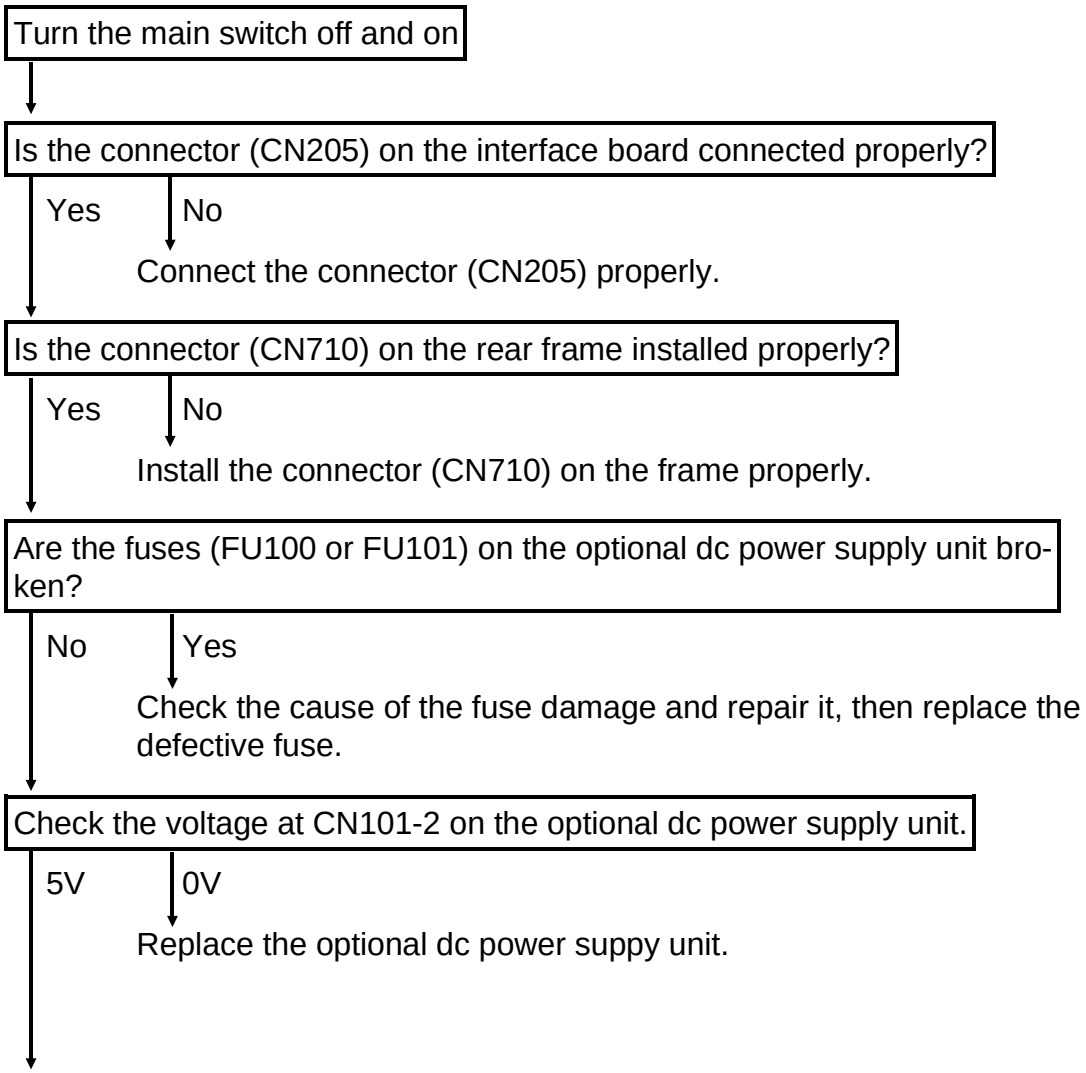
- Definition -

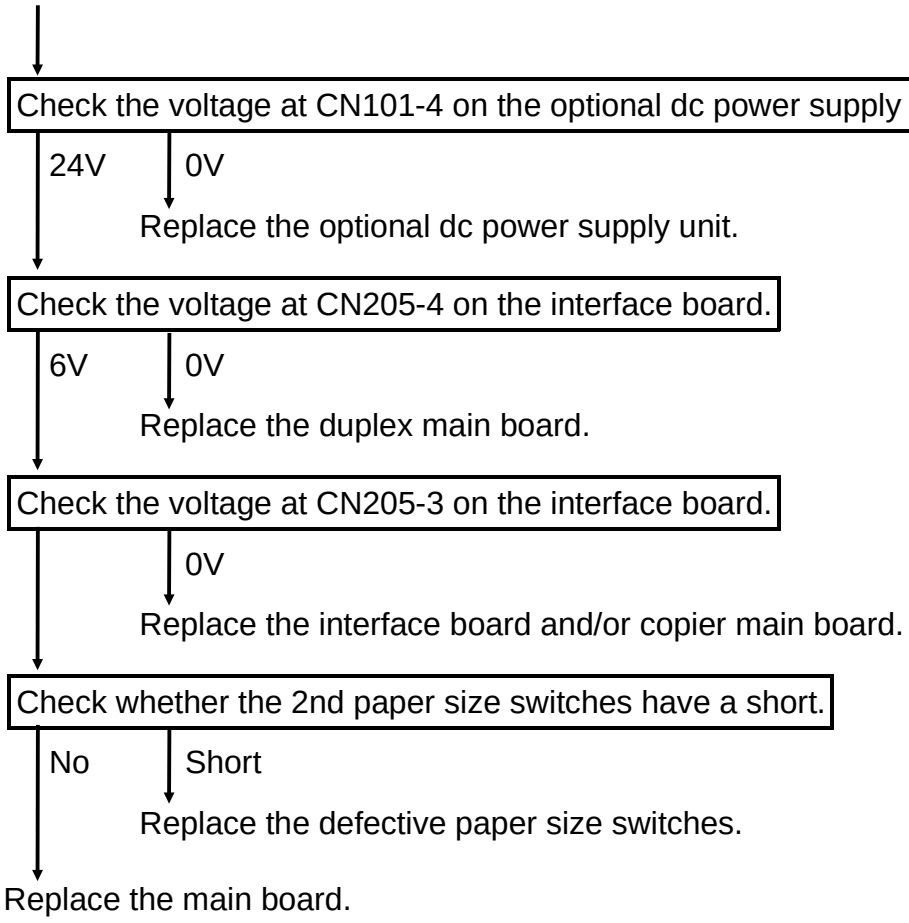
The copier main board does not receive any signal from the duplex main board.

- Possible Causes -

- Interface board defective
- Copier main board defective
- Duplex main board defective
- Optional dc power supply unit defective
- 2nd paper size switches shorted

- Action -


Turn the main switch off and on
Is the connector (CN205) on the interface board connected properly?
Yes
No
Connect the connector (CN205) properly.
Is the connector (CN710) on the rear frame installed properly?
Yes
No
Install the connector (CN710) on the frame properly.
Are the fuses (FU100 or FU101) on the optional dc power supply unit broken?
No
Yes
Check the cause of the fuse damage and repair it, then replace the defective fuse.
Check the voltage at CN101-2 on the optional dc power supply unit.
5V
0V
Replace the optional dc power suppy unit.


Check the voltage at CN101-4 on the optional dc power supply unit.
24V
0V
Replace the optional dc power supply unit.
Check the voltage at CN205-4 on the interface board.
6V
0V
Replace the duplex main board.
Check the voltage at CN205-3 on the interface board.
0V
Replace the interface board and/or copier main board.
Check whether the 2nd paper size switches have a short.
No
Short
Replace the defective paper size switches.
Replace the main board.

2.15 CODE #81 — INTERFACE BOARD ERROR

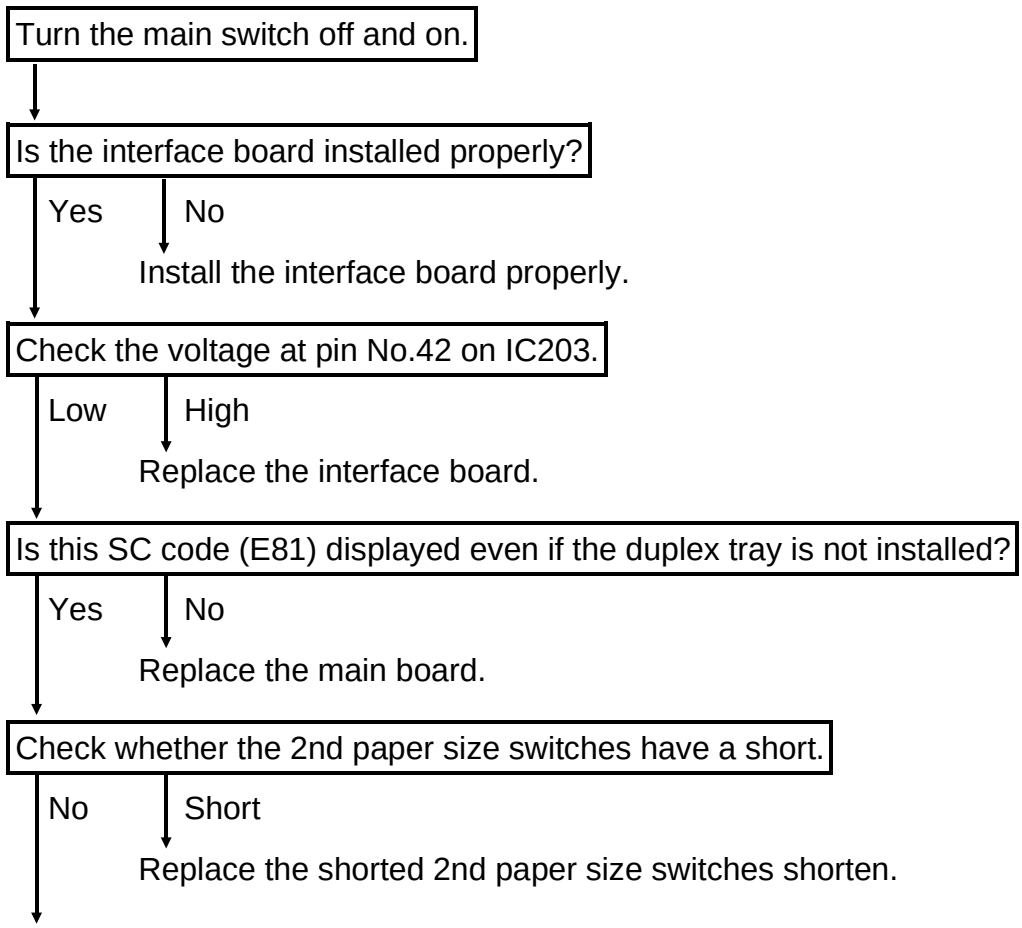
- Definition -

The interface board is not connected when the duplex unit is installed.

- Possible Causes -

- Interface board installed incorrectly
- Interface board defective
- Main board defective
- 2nd paper size switch shorted

- Action -


Turn the main switch off and on.
Is the interface board installed properly?
Yes
No
Install the interface board properly.
Check the voltage at pin No.42 on IC203.
Low
High
Replace the interface board.
Is this SC code (E81) displayed even if the duplex tray is not installed?
Yes
No
Replace the main board.
Check whether the 2nd paper size switches have a short.
No
Short
Replace the shorted 2nd paper size switches shorten.

Replace the main board.

2.16 CODE #82 — JOGGER HOME POSITION ERROR

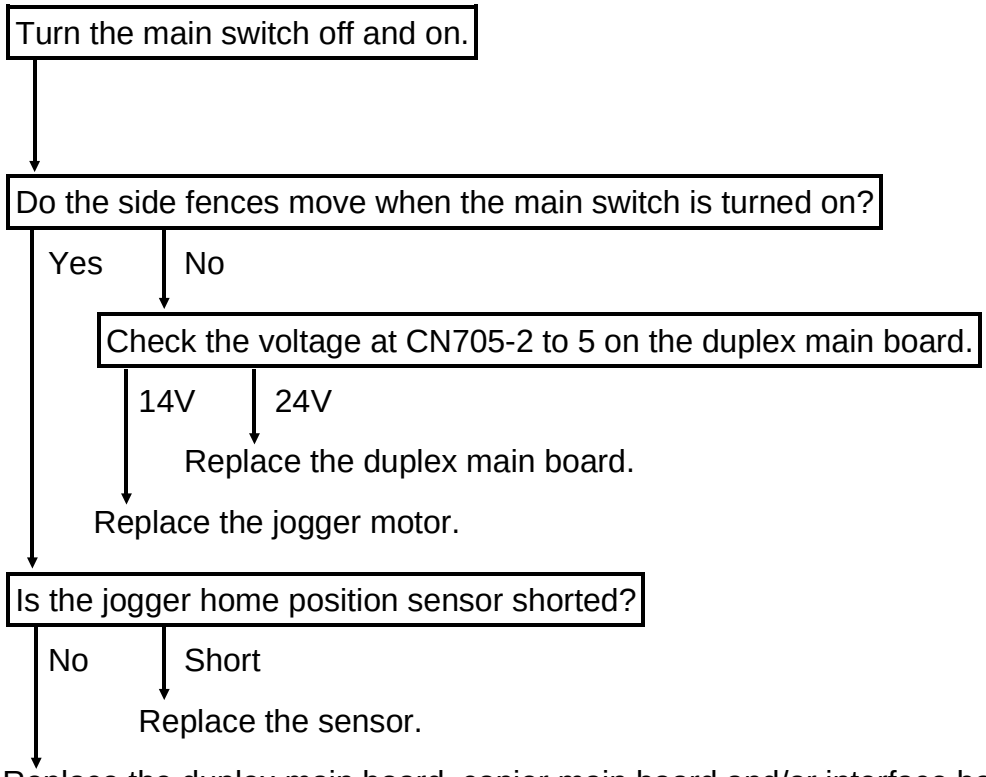
- Definition -

The output of the jogger home position sensor stays LOW while the duplex main board is driving the jogger fences outward.

- Possible Causes -

- Jogger home position sensor shorted
- Jogger motor defective
- Duplex main board defective
- Copier main board defective
- Interface board defective

- Action -


Turn the main switch off and on.
Do the side fences move when the main switch is turned on?
Yes
No
Check the voltage at CN705-2 to 5 on the duplex main board.
14V
24V
Replace the duplex main board.
Replace the jogger motor.
Is the jogger home position sensor shorted?
No
Short
Replace the sensor.

Replace the duplex main board, copier main board and/or interface board.

2.17 CODE #83 — JOGGER HOME POSITION ERROR

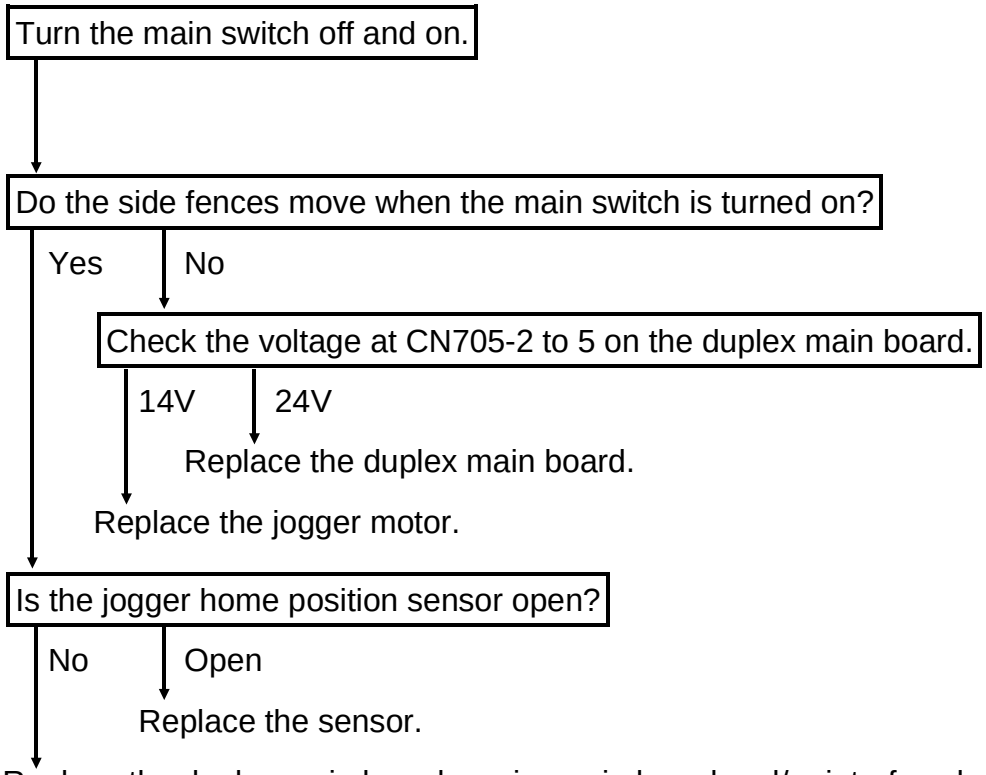
- Definition -

The output of the jogger home position sensor remains HIGH as the duplex main board is driving the jogger fences inward.

- Possible Causes -

- Jogger home position sensor open
- Jogger motor defective
- Duplex main board defective
- Copier main board defective
- Interface board defective

- Action -


Turn the main switch off and on.
Do the side fences move when the main switch is turned on?
Yes
No
Check the voltage at CN705-2 to 5 on the duplex main board.
14V
24V
Replace the duplex main board.
Replace the jogger motor.
Is the jogger home position sensor open?
No
Open
Replace the sensor.

Replace the duplex main board, copier main board and/or interface board.

2.18 ABNORMAL CONDITION IN TONER DENSITY DETECTION

- Symptom -

The Auto ID indicator or the selected manual ID level blinks. (No SC Code is indicated.)

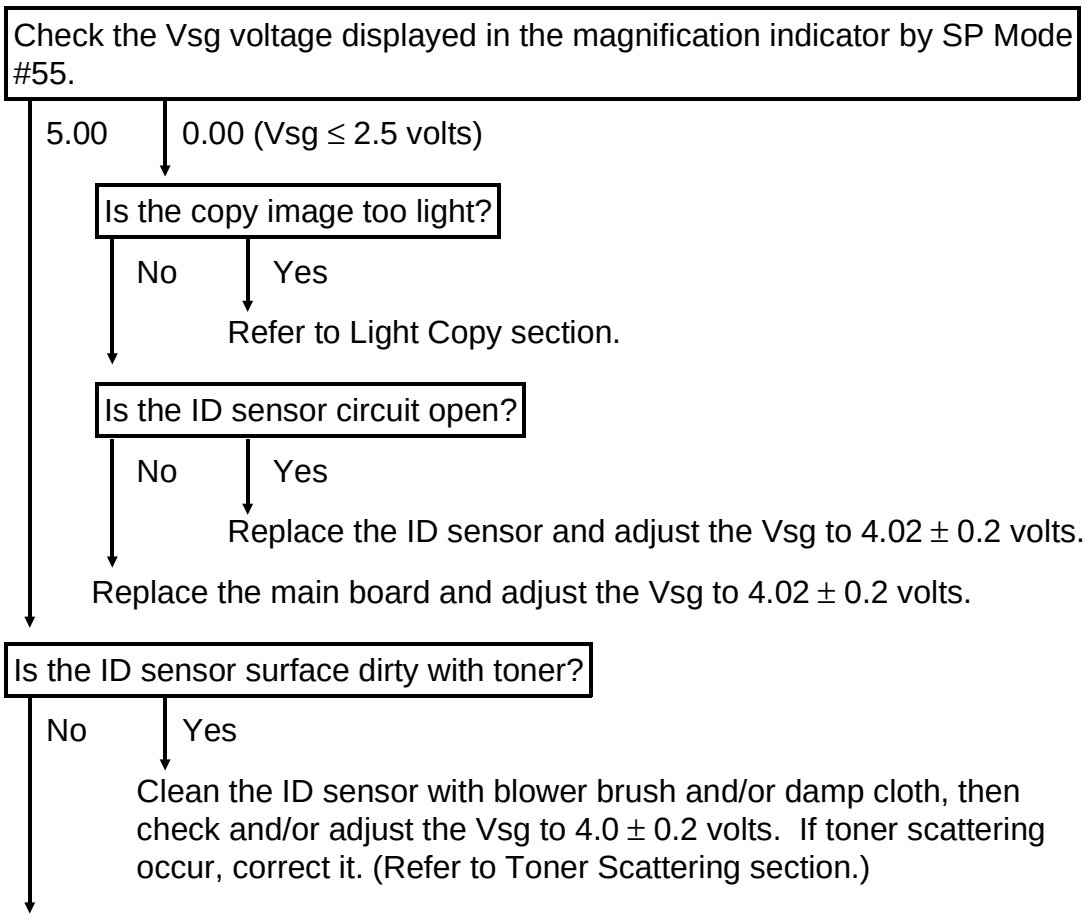
- Definition -

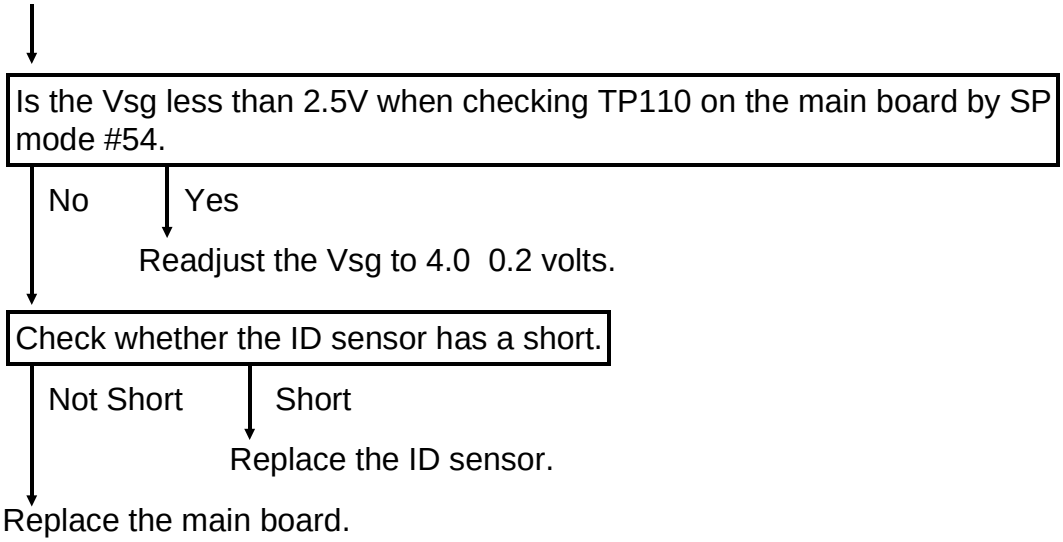
If the Vsg goes below 2.5 volts or Vsp goes above 7.5 volts 5 times in a row.

- Possible Causes -

- Incorrect Vsg voltage
- Dirty ID sensor
- Low toner density
- ID sensor defect
- Main board defect

- Action -


Check the Vsg voltage displayed in the magnification indicator by SP Mode #55.
5.00
0.00 (Vsg ≤ 2.5 volts)
Is the copy image too light?
No
Yes
Refer to Light Copy section.
Is the ID sensor circuit open?
No
Yes
Replace the ID sensor and adjust the Vsg to 4.02 ± 0.2 volts.
Replace the main board and adjust the Vsg to 4.02 ± 0.2 volts.
Is the ID sensor surface dirty with toner?
No
Yes
Clean the ID sensor with blower brush and/or damp cloth, then check and/or adjust the Vsg to 4.0 ± 0.2 volts. If toner scattering occur, correct it. (Refer to Toner Scattering section.)


Is the Vsg less than 2.5V when checking TP110 on the main board by SP mode #54.
No
Yes
Readjust the Vsg to 4.0 0.2 volts.
Check whether the ID sensor has a short.
Not Short
Short
Replace the ID sensor.
Replace the main board.

3. ELECTRICAL COMPONENT DEFECTS

3.1 SENSORS

Component	Condition	Symptom
Scanner Home Position Sensor (S1)	OPEN (CN122-4 stays HIGH)	SC code (E22) is displayed.
	SHORTED (CN122-4 stays LOW)	SC code (E21) is displayed.
Lens Home Position Sensor (S2)	OPEN (CN102-8 stays HIGH)	SC code (E29) is displayed.
	SHORTED (CN102-8 stays LOW)	SC code (E28) is displayed.
4th/5th Mirror Home Position Sensor (S3)	OPEN (CN102-11 stays HIGH)	SC code (E2A) is displayed.
	SHORTED (CN102-11 stays LOW)	SC code (E2B) is displayed.
Registration Sensor (S4)	OPEN (CN101-9 stays HIGH)	"Check Paper Path" indicator (location "A" or "B") blinks when a copy is made.
	SHORTED (CN101-9 stays LOW)	"Check Paper Path" indicator (location "A" or "B") lights when the main switch is turned on.
Exit Sensor (S5)	OPEN (CN141-2 stays HIGH)	"Check Paper Path" indicator (location "D") blinks when a copy is made.
	SHORTED (CN141-2 stays LOW)	"Check Paper Path" indicator (location "D") lights when the main switch is turned on.
Paper End Sensor 1st and 2nd (S6 and S7)	OPEN (1st: CN125-5 stays HIGH) (2nd: CN139-4 stays HIGH)	"Load Paper" indicator lights even when paper is in the cassette or tray.
	SHORTED (1st: CN125-5 stays LOW) (2nd: CN139-4 stays LOW)	"Load Paper" indicator lights even when the cassette or tray is empty.
Toner End Sensor (S8)	OPEN (CN114-2 stays HIGH)	The CPU detects toner end condition using Vsp/Vsg value. If the ID sensor is defective, the CPU fails to detect toner end and the image density may become too low.
	SHORTED (CN114-2 stays LOW)	
Toner Overflow Sensor (S9)	OPEN (CN101-2 stays HIGH)	"E70" blinks in the magnification indicator even when used toner tank is not full.
	SHORTED (CN101-2 stays LOW)	"E70" does not blink.

Paper Lift Sensor (S10)	OPEN (CN125-2 stays HIGH)	User Code #5 is displayed.
	SHORTED (CN125-2 stays LOW)	The cassette bottom plate does not rise to the paper feed position.
Component	**Condition**	**Symptom**
Image Density (ID Sensor) (S11)	OPEN (CN110-3 stays HIGH)	The CPU detects an ID sensor abnormal condition. The ADS or Manual Image Density indicator starts blinking.
	SHORTED (CN110-3 stays LOW)	
Development Unit Set Sensor (S12)	OPEN (CN123-2 stays HIGH)	The CPU fails to detect User Code #3 even when the development unit is not set.
	SHORTED (CN123-2 stays LOW)	User code #3 is displayed even when the development unit is set.

3.2 SWITCHES AND OTHER ELECTRICAL COMPONENTS

Component	Condition	Symptom
Main Switch (SW1)	OPEN	The copier does not turns on.
	SHORTED	The copier does not turns off.
Cover Safety Switch (SW2)	OPEN	The copier does not tunrs on.
	SHORTED	The copier does not turn off when the front or exit cover is opened.
Paper Size Switch (1st and 2nd) (SW3 to 9)	OPEN	The CPU cannot detect proper paper size, and misfeeds may occur when a copy is made.
	SHORTED	
Color Switch (SW8)	OPEN (CN114-4 and/or 6 stays HIGH)	The CPU cannot properly control the copy process system for the development unit (black or color). This may cause an abnormal image (dirty backfround, light copy, etc.)
	SHORTED (CN114-4 and/or 6 stays LOW)	
Manual Feed Table Switch (SW9)	OPEN (CN114-8 stays HIGH)	The CPU does not detect manual feed mode even when the manual feed table is opened.
	SHORTED (CN114-8 stays LOW)	The "Manual Feed" indicator stays on even when the manual feed table is closed.
Right Cover Switch (SW10)	OPEN (CN117-2 stays HIGH)	The CPU does not display User Code #1 even when the right cover is opened.
	SHORTED (CN117-2 stays LOW)	User Code #1 is displayed even when the right cover is closed.
Exposure Lamp (L1)	OPEN	SC Code (E11) is displayed.
Fusing Lamp (L2)	OPEN	SC Code (E52) is displayed.
Fusing Thermistor (TH)	OPEN	SC Code (E55) is displayed.
Fusing Thermofuse (TF)	OPEN	SC Code (E52) is displayed.
Optics Thermoswitch (TS)	OPEN	SC Code (E11) is displayed.

3.3 FUSES

Component	Condition	Symptom
FU401 (AC Drive Board)	OPEN	The copier does not turn on when the main switch is turned on.
FU100 (5V) (Main DC PSU)	OPEN	The copier does not turn on even when the main switch is turned on.
FU101 (24V) (Main DC PSU)	OPEN	SC Code #21 or #22 is displayed depending on the 1st scanner position.
FU102 (30V) (Main DC PSU)	OPEN	SC Code #21 or #22 is displayed depending on the 1st scanner position.
FU100 (5V) (Optional DC PSU)	OPEN	Duplex Tray: SC Code #80 is displayed. ADF: The feed-out motor starts rotating when the main switch is turned on.
FU101 (24V) (Optional DC PSU)	OPEN	Duplex Tray: SC Code #80 is displayed. ADF: The ADF does not work.

SECTION 8

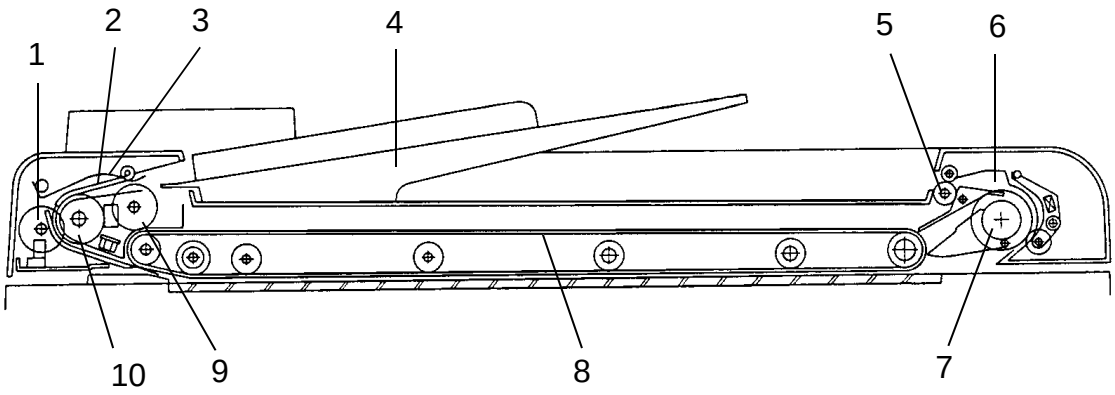
DOCUMENT FEEDER

1. SPECIFICATIONS

Original Size and Weight:	— Thin original mode — Maximum A3 / 11" x 17" Minimum B6 / 5 1/2" x 8 1/2" Weight 41 to 128 g/m^2 (11 to 34 lb) — Thick original mode — Maximum A3 / 11" x 17" Minimum B6 / 5 1/2" x 8 1/2" Weight 52 to 128 g/m^2 (14 to 34 lb) — Auto reverse mode — Maximum A3 / 11" x 17" Minimum B6 lengthwise / 5 1/2" x 8 1/2" lengthwise Weight 64 to 105 g/m^2 (17 to 28 lb)
Original Feed:	Automatic feed — ADF mode Manual feed one by one — SADF mode
Original Table Capacity:	30 sheets / 80 g/m^2 (20 lb)
Original Set:	Face up. First sheet on top
Original Transport:	One flat belt
Copy Speed:	16 copies/minute for A4 / 8 1/2" x 11" sideways
Power Consumption:	20 W
Dimensions (W x D x H):	670 x 460 x 103 mm (26.4" x 18.1" x 4.1")
Weight:	Approximately 8.8 kg (19.4 lb)

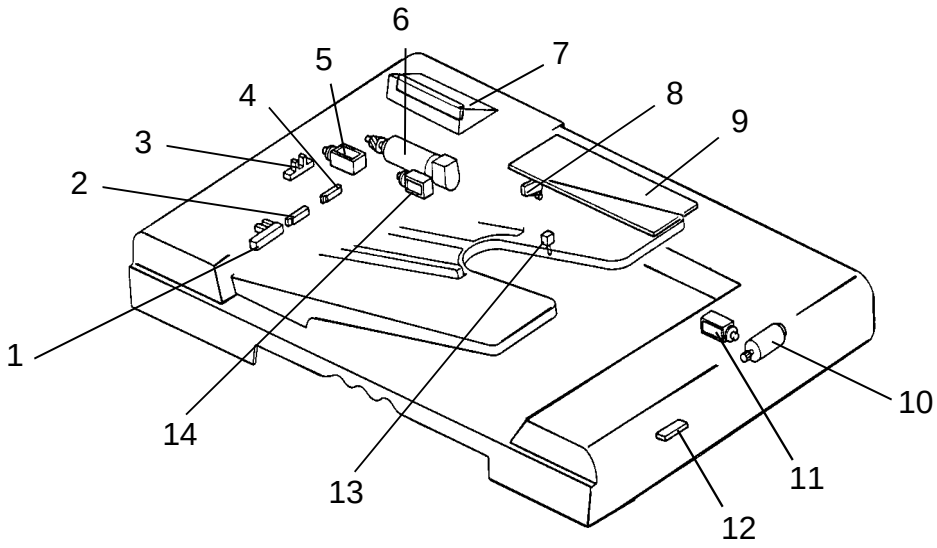
2. COMPONENT LAYOUT

- Mechanical Components -



1. Pulse Generator Disk
2. Friction Belt
3. Pick-up Lever
4. Original Table
5. Exit Roller
6. Inverter Pawl
7. Inverter Roller
8. Transport Belt
9. Pick-up Roller
10. Feed Roller

- Electrical Components -

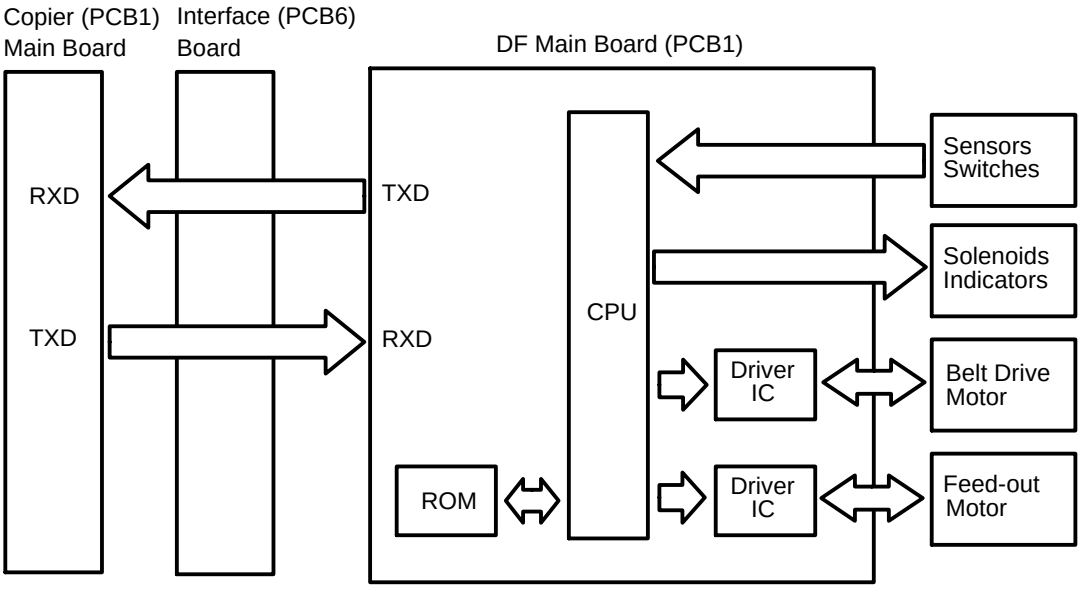


1. Original Set Sensor
2. Registration Sensor
3. Pulse Generator Sensor
4. Original Width Sensor
5. Pick-up Solenoid
6. Belt Drive Motor
7. Indicator Panel
8. Lift Switch
9. DF Main Board
10. Feed-out Motor
11. Inverter Solenoid
12. Feed-out Sensor
13. Original Select Switch
14. Feed-in Solenoid

3. ELECTRICAL COMPONENT DESCRIPTIONS

Symbol	Name	Function	Location
Motors			
M1	Belt Drive Motor	DC servomotor that drives to the transport belt and feed-in system (pick-up roller, feed roller, pull-out roller and relay roller).	6
M2	Feed-out Motor	DC servomotor that drives the feed-out unit of the DF.	10
Solenoids			
SOL1	Pick-up Solenoid	Energizes to press the pick-up lever against the stack of originals in preparation for original feed-in.	5
SOL2	Feed-in Solenoid	Turns on to engage the feed-in clutch so rotation is transmitted to the feed roller, pull-out rollers, and relay rollers.	14
SOL3	Inverter Solenoid	Energizes to invert the original when copying two sided originals.	11
Switches			
SW1	Lift Switch	Informs the CPU when the DF is lifted and also serves as the jam reset switch for the DF.	8
SW2	Original Select Switch	Selects thick original mode or thin original mode.	13
Sensors			
S1	Original Set Sensor	Informs copier CPU that originals have been placed and causes the Insert Original indicator to go out.	1
S2	Registration Sensor	Sets original stop timing and measures original length.	2
S3	Original Width Sensor	Determines the width of the originals.	4
S4	Pulse Generator Sensor	Generates pulses used to measure the original length.	3
S5	Feed-out Sensor	Checks for original misfeeds and sets original stop timing when in auto reverse mode.	12
Printed Circuit Boards			
PCB1	DF Main Board	Controls all DF functions.	9
PCB2	Indicator Panel Board	Contains operator indicators.	7

4. OVERALL MACHINE CONTROL



The DF CPU monitors the input signals from the sensors and switches, and energizes the solenoids and the indicator LEDs directly. The belt drive motor and the inverter motor are controlled by the DF CPU through their respective driver ICs. The exchanged signals are shown in the tables on the next page.

1. DF to Copier

No.	Signal Name	Definition
1	Original Set	Originals are set on the original table
2	Copy Start	Allows the copier to start copy sequence
3	Lift Up	The DF is lifted
4	DF Misfeed	Misfeed occurs in the DF

2. Copier to DF

No.	Signal Name	Definition
1	Feed-in	Requests the DF to feed-in the original
2	Feed-out	Requests the DF to feed-out the original
3	Invert Original	Requests the DF to invert the original
4	Auto Feed	Shifts the DF to the auto feed mode
5	Original Stay	Attempt to use DF but the original from the previous copy run remains on the exposure glass

5. BASIC OPERATION

1. One-sided Original Feed

When an original is inserted face up into the DF, the Insert Original indicator light goes out and the DF informs the copier CPU that originals have been set.

When the Start key is pressed, the copier CPU sends the feed-in signal to the DF. On receipt of this signal, the DF energizes the pick-up solenoid, the feed-in solenoid, and the belt drive motor in order to feed-in the bottom sheet of the original stack onto the exposure glass. The pick-up solenoid and the feed-in solenoid remain energized until the original leading edge reaches the DF registration sensor. The belt drive motor turns off shortly after the original's trailing edge passes the DF registration sensor.

While feeding the original, the DF registration sensor and the paper width sensor check the original size.

Just when the original trailing edge has passed the DF registration sensor, the DF CPU sends the copy start signal to the copier.

When the scanner reaches the return position, the copier CPU sends the feed-out and the feed-in signals to the DF CPU in order to exchange the original with the next original. At this time, the scanner begins returning to the home position.

When the scanner comes to the return position after scanning the last original, the copier CPU only sends the feed-out signal in order to feed-out the last original.

2. Two-sided Original Feed

Unlike one-sided original feed, the back side of the original must be copied first to keep the originals and copies in the correct order.

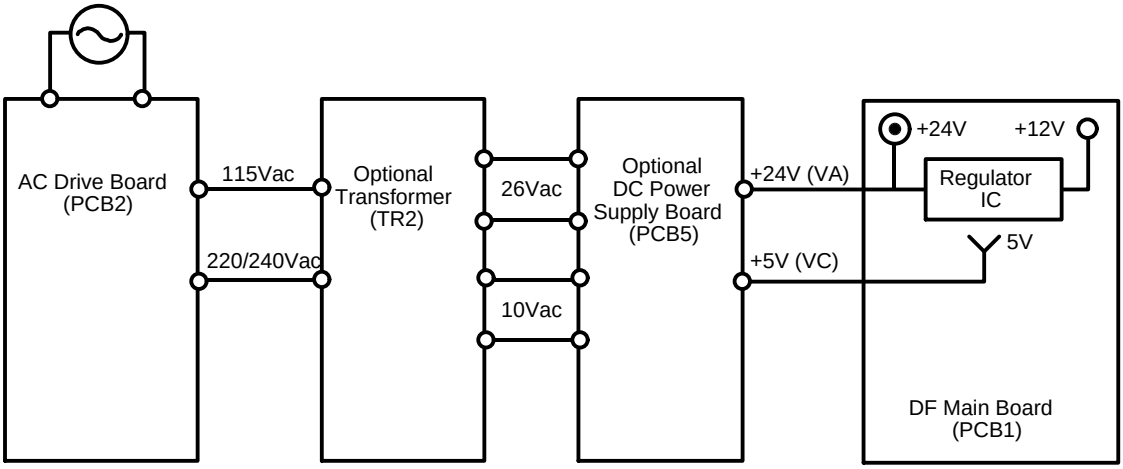
During original feed-in, the sequence is the same as for one-sided feed; however, the DF CPU also energizes the inverter motor and the inverter solenoid a short time after the original trailing edge has passed the DF registration sensor. The belt drive motor continues to feed the original until the original leading edge passes the feed-out sensor. At this point the inverter mechanism inverts the original, in preparation for copying the back side. Then the belt drive motor reverses and the original is fed towards the left scale and is aligned against the scale. The DF CPU sends the copy start signal a short time after the original trailing edge has passed the feed-out sensor.

When the scanner reaches the return position, the copier CPU sends the invert original signal to the DF CPU in order to make a copy of the front side. The original is inverted in the same way as for back side copying.

3. Semi-automatic Document Feed

If a single original is inserted into the original table and copied, the DF shifts to the semi-automatic feed mode and lights the Auto Feed indicator. The Auto Feed indicator remains on for five seconds after the copier main motor stops. If another original is inserted within that five-second period, it is automatically fed and copied.

6. POWER DISTRIBUTION

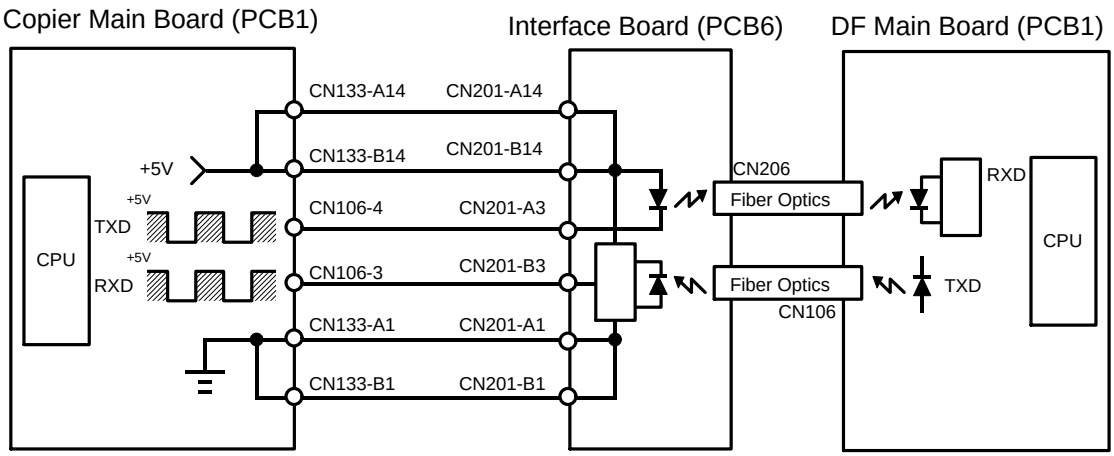


The DF uses three DC power levels: +24 volts, +12 V, and +5 V.

When the main switch is turned on, the optional transformer receives the wall outlet ac power through the ac drive board and outputs 10 volts ac and 26 volts ac to the optional dc power supply board. The optional dc power supply board then converts the 10 volts ac input to +5 volts dc and the 26 volts ac input to +24 volts. Then, thoes two dc voltsges are supplied to the DF main board.

The regulator IC on the DF main board further steps down the +24V to +12V.

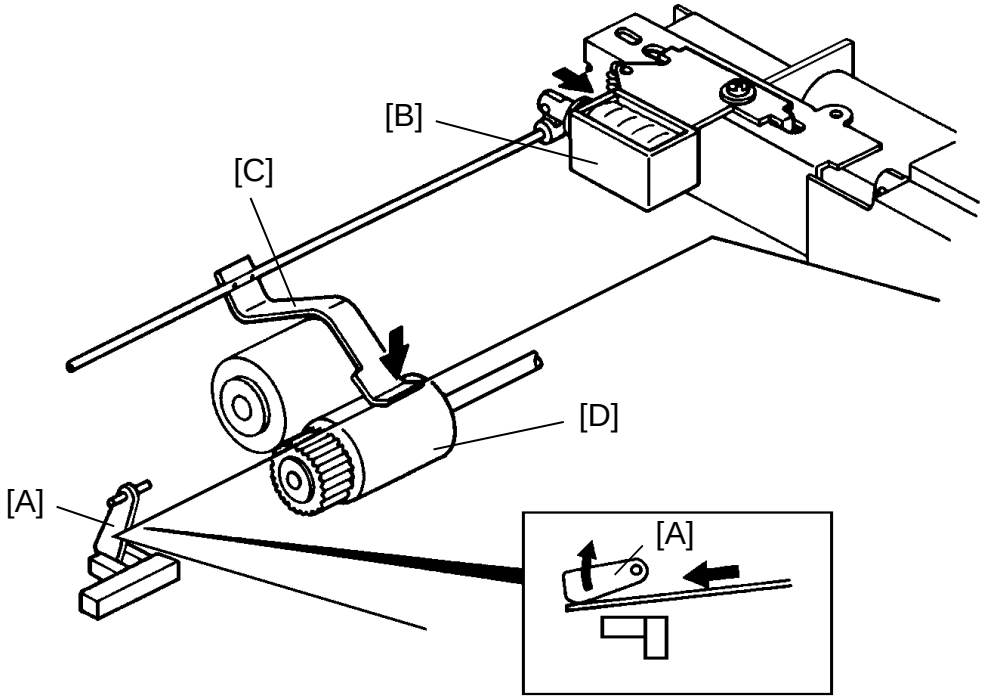
7. INTERFACE CIRCUIT



The copier CPU and the DF CPU communicate via the interface board and fiber optics. The interface board changes the optical signals to electrical signals (and vice versa).

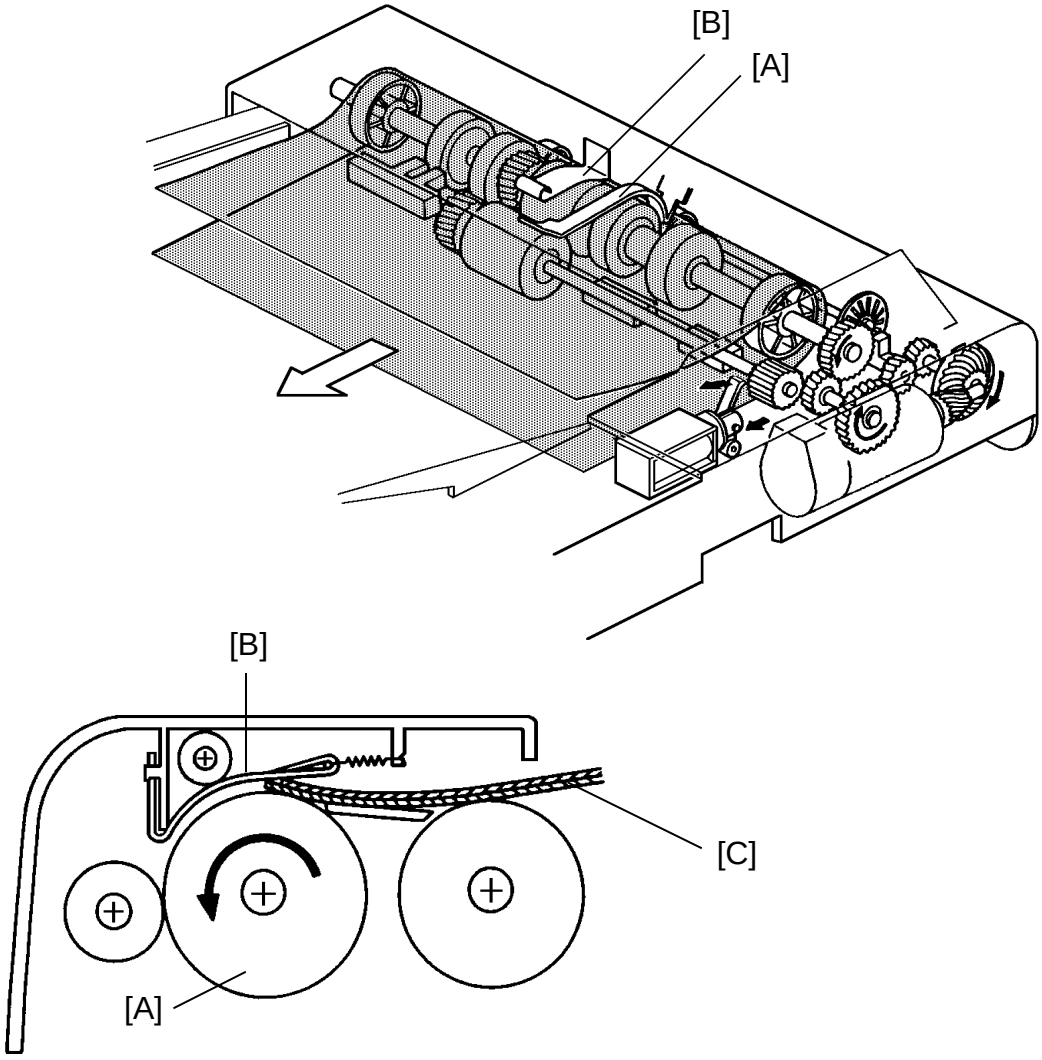
8. ORIGINAL FEED

8.1 ORIGINAL PICK-UP



After setting the originals on the original table, the originals contact the feeler [A] of the original set sensor and cause the feeler to move out of the sensor. The DF then sends the original set signal to the copier CPU to inform it that the DF will be used. When the Start key is pressed, the pick-up solenoid [B] is energized. The original stack is then pressed between the pick-up lever [C] and pick-up roller [D]. The rotation of the pick-up roller advances the bottom original.

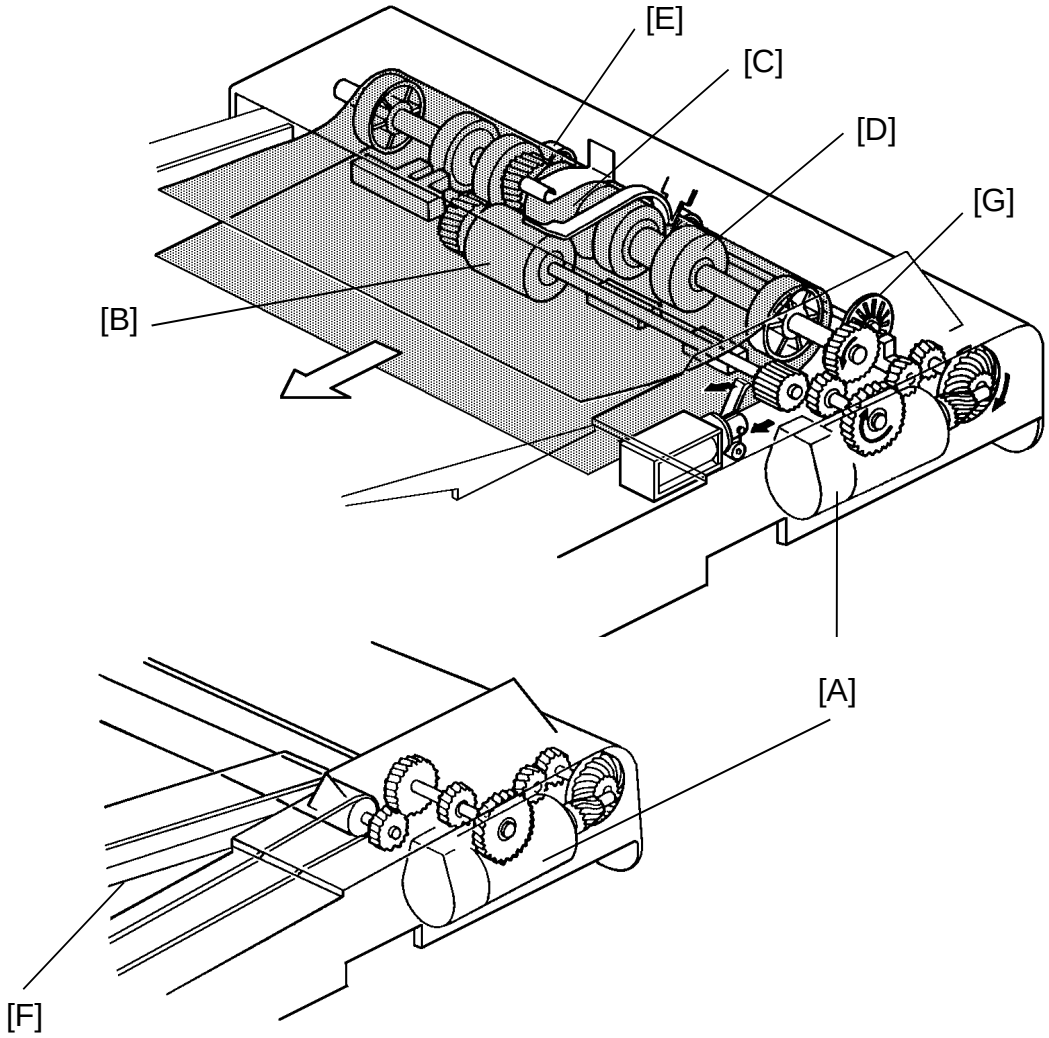
8.2 ORIGINAL SEPARATION



The feed roller [A] and the friction belt [B] are used to feed-in and separate the originals [C]. Only the bottom original is fed because the friction belt prevents any other originals from feeding.

Original feed starts when the feed roller starts turning and advances the bottom original of the stack. The feed roller moves the original past the friction belt because the driving force of the feed roller is greater than the resistance of the friction belt. The friction belt prevents multiple feeds because the resistance of the friction belt is greater than the friction between original sheets.

8.3 ORIGINAL FEED-IN MECHANISM

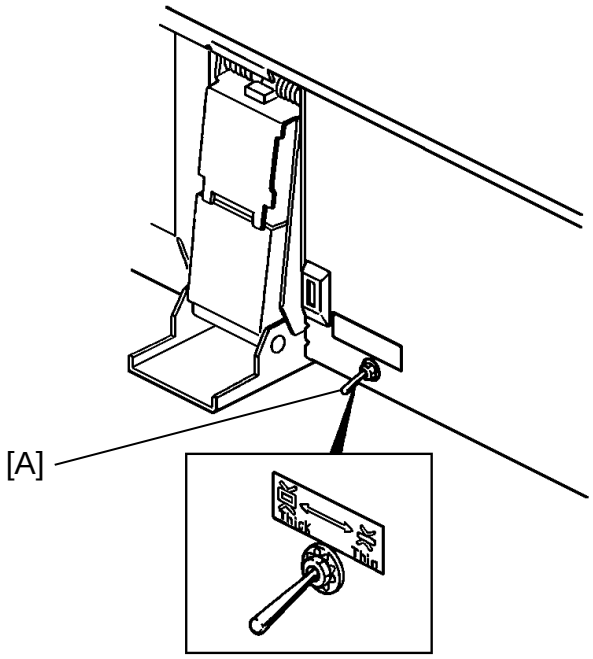


The belt drive motor [A] drives the pick-up roller [B], the feed roller [C], the pull out roller [D], the relay roller [E], and transport belt [F] via a feed clutch and a gear train.

The pick-up and feed-in solenoids are energized 100 milliseconds after the Start key of the copier is pressed. Then 100 milliseconds after the solenoids are energized, the belt drive motor starts turning. The pulse generator disc [G] always turns when the belt drive motor is on.

Slightly after the original trailing edge passes the registration sensor, the relay rollers and the transport belt stop turning.

This document feeder has two different ways of stopping originals at the correct position on the exposure glass. They are called the "thin original mode" and the "thick original mode". The mode used is determined by the original select switch [A].



- Original Select Switch -

1. Thin Original Mode

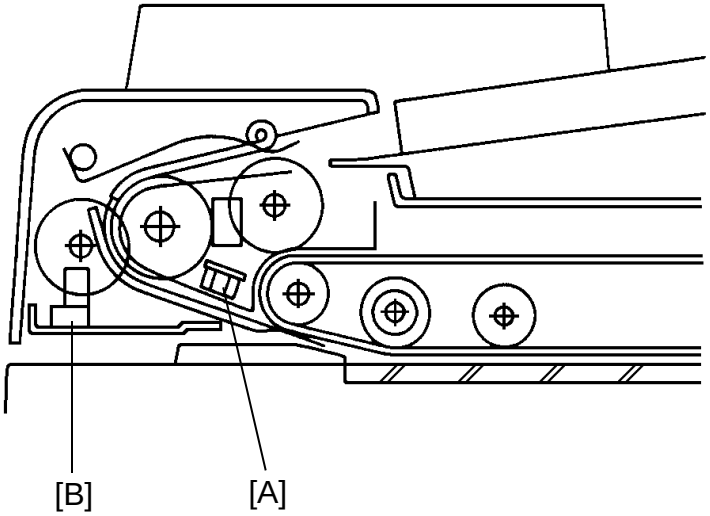
The original is stopped at the correct position on the exposure glass based on encoder pulse count. The belt drive motor stops shortly after the original trailing edge passes the DF registration sensor. (Exact timing depends on registration adjustment.) Thin original mode is selected at the factory.

2. Thick Original Mode

When thick original mode is selected, the belt drive motor remains energized for an additional 30 encoder pulses as compared to thin original mode. Then, the belt drive motor pauses and reverses for 21 pulses. This forces the original against the left scale and thus aligns the edge of the original with the scale.

After the exposure cycle is completed, the copier sends the feed-out signal to the DF CPU and the belt drive and feed out motors start turning. At this time, the copied original feeds out and the next original feeds in.

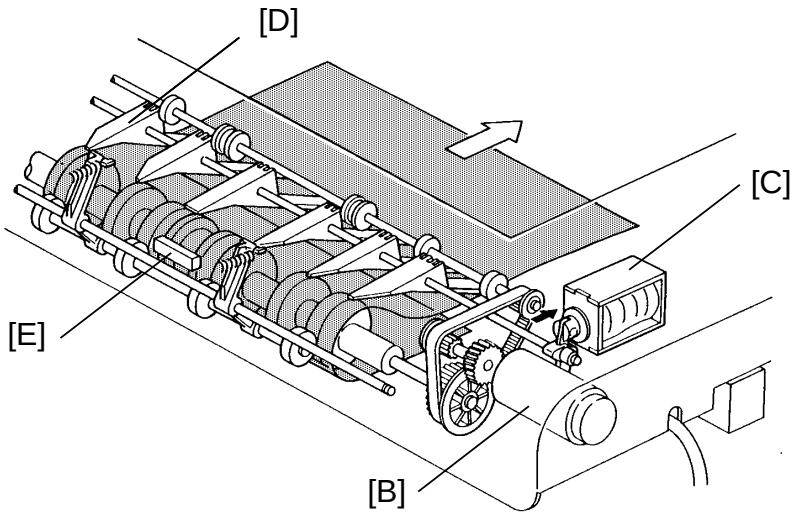
8.4 ORIGINAL SIZE DETECTION



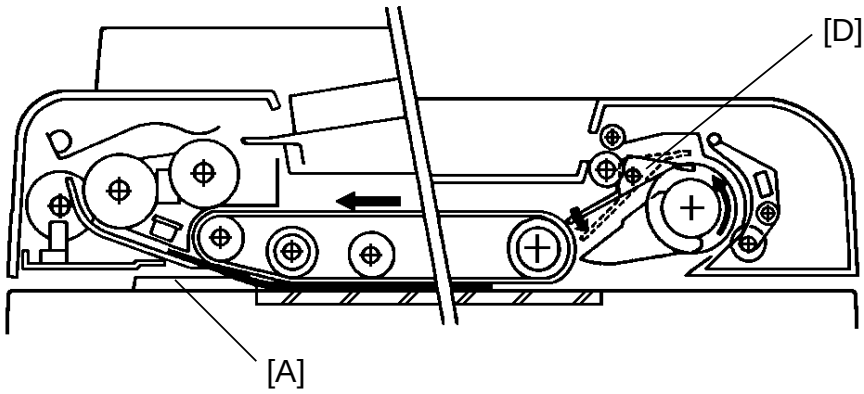
The DF determines original size (both width and length) through the use of the original width sensor [A], registration sensor, and pulse generator sensor [B]. The original's length is calculated by counting the number of pulses from the pulse generator while the registration sensor is on.

Original size detection is necessary for the feed-in/feed-out timing of the DF.

8.5 ORIGINAL INVERSION MECHANISM



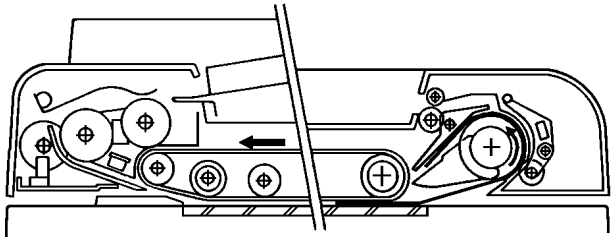
1)



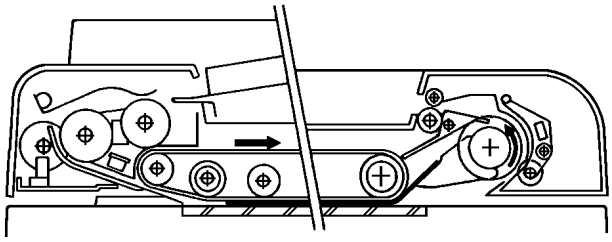
The two sided originals are inverted in the feed-out unit.

1) When the copier Start key is pressed, the two sided original is fed into the feed-in unit, passing over the DF registration sensor [A]. The feed-out motor [B] and the inverter solenoid [C] turn on 100 milliseconds after the original trailing edge passes the registration sensor. When the inverter solenoid turns on, the inverter pawls [D] rotate counterclockwise.

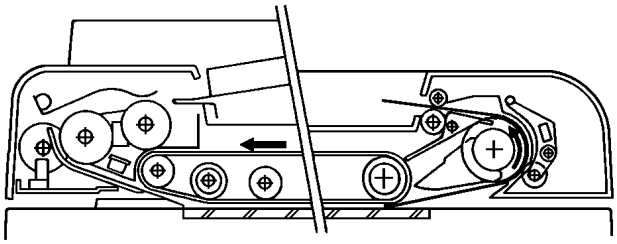
2) 4)



3) 5)



6)



2) The original passes over the exposure glass and feeds into the feed-out unit.

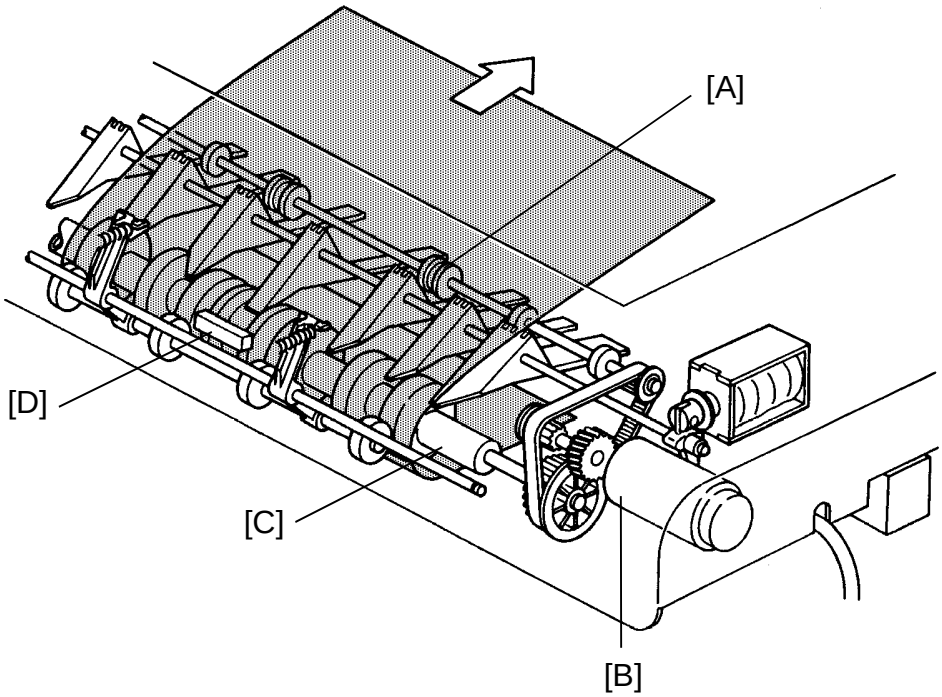
3) The original is directed onto the exposure glass again by the inverter pawls. The belt drive motor now reverses 140 milliseconds after the feed out sensor [E] turns on. The transport belt then moves the original toward the left scale. Slightly before the original reaches the left scale, the belt drive motor drops to half speed. This is to prevent damaging the edge of the original against the left scale.
When the original leading edge reaches the left scale, the belt drive motor stops. At the same time, the feed-out motor and the inverter solenoid turn off.

4) After the reverse side of the original is exposed, the belt drive motor, the feed-out motor, and the inverter solenoid turn on, and the original is fed into the inverter section. (This is the same as step 2 above.)

5) The original is fed onto the exposure glass again as in step 3 above. The front side of the original is then copied.

6) After the front side of the original has been exposed, the original is fed out from the DF.

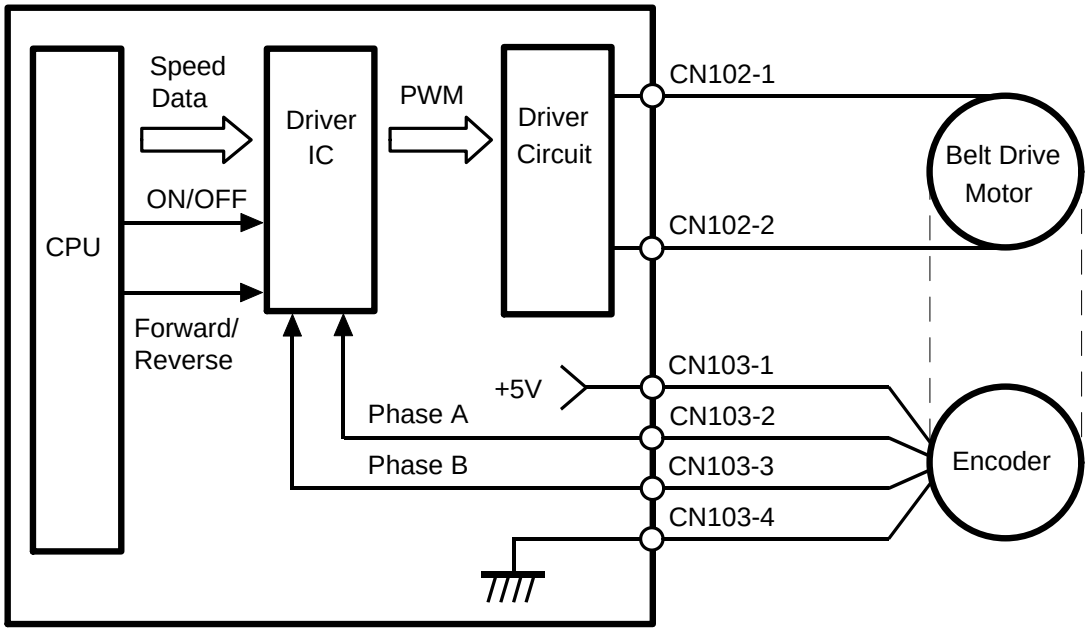
8.6 ORIGINAL FEED-OUT MECHANISM



The exit rollers [A] are driven by the inverter motor [B]. When the document feeder receives the feed out signal from the copier, the transport belt and the exit rollers start turning simultaneously. The transport belt carries the original to the inverter rollers [C] and the exit rollers take over the original feed-out. When the original trailing edge passes the feed-out sensor [D], the feed-out motor drops to half of its normal speed for 220 milliseconds and then stops. The lower speed prevents uneven stacking of originals. For A3 or double letter size originals, the feed-out motor speed does not change due to the length of the originals.

8.7 BELT DRIVE MOTOR CIRCUIT

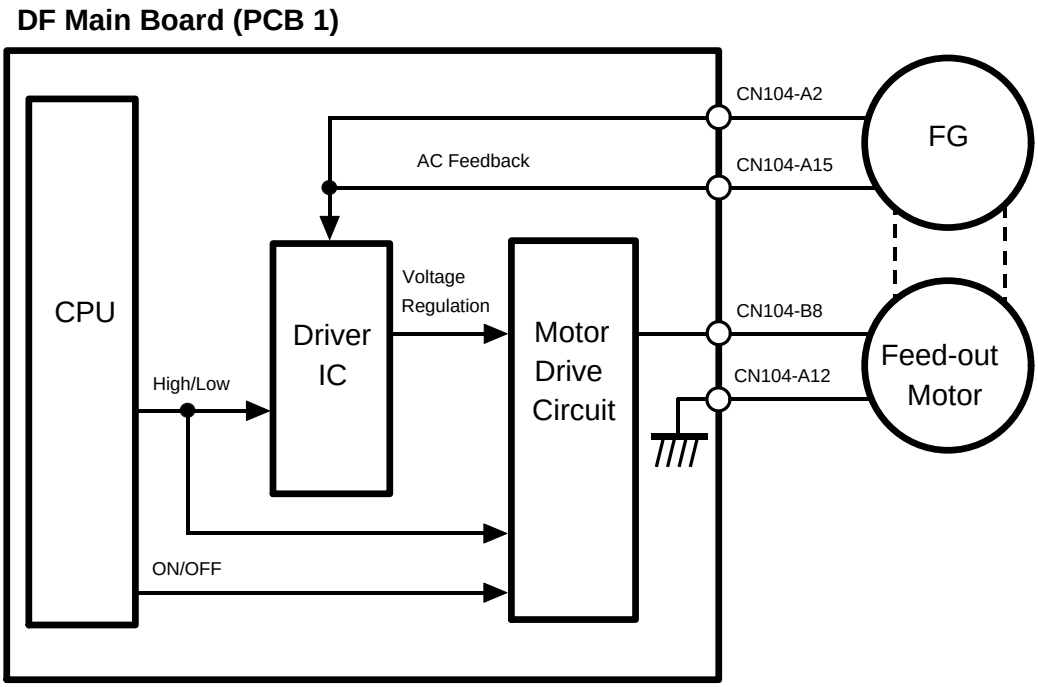
DF Main Board (PCB 1)



A dc servomotor is used as the belt drive motor. The driver IC controls the speed of the belt drive motor. The CPU sends the speed data (programmed) to the driver IC. The driver IC sends the pulse-width-modulation (PWM) signal to the driver circuit, which sends the motor drive pulses.

An encoder in the servomotor has two magnetic sensors that generate two pulse signals (phase A and B). The driver IC monitors the belt speed and direction by these pulse signals and uses this data to regulate the motor's speed.

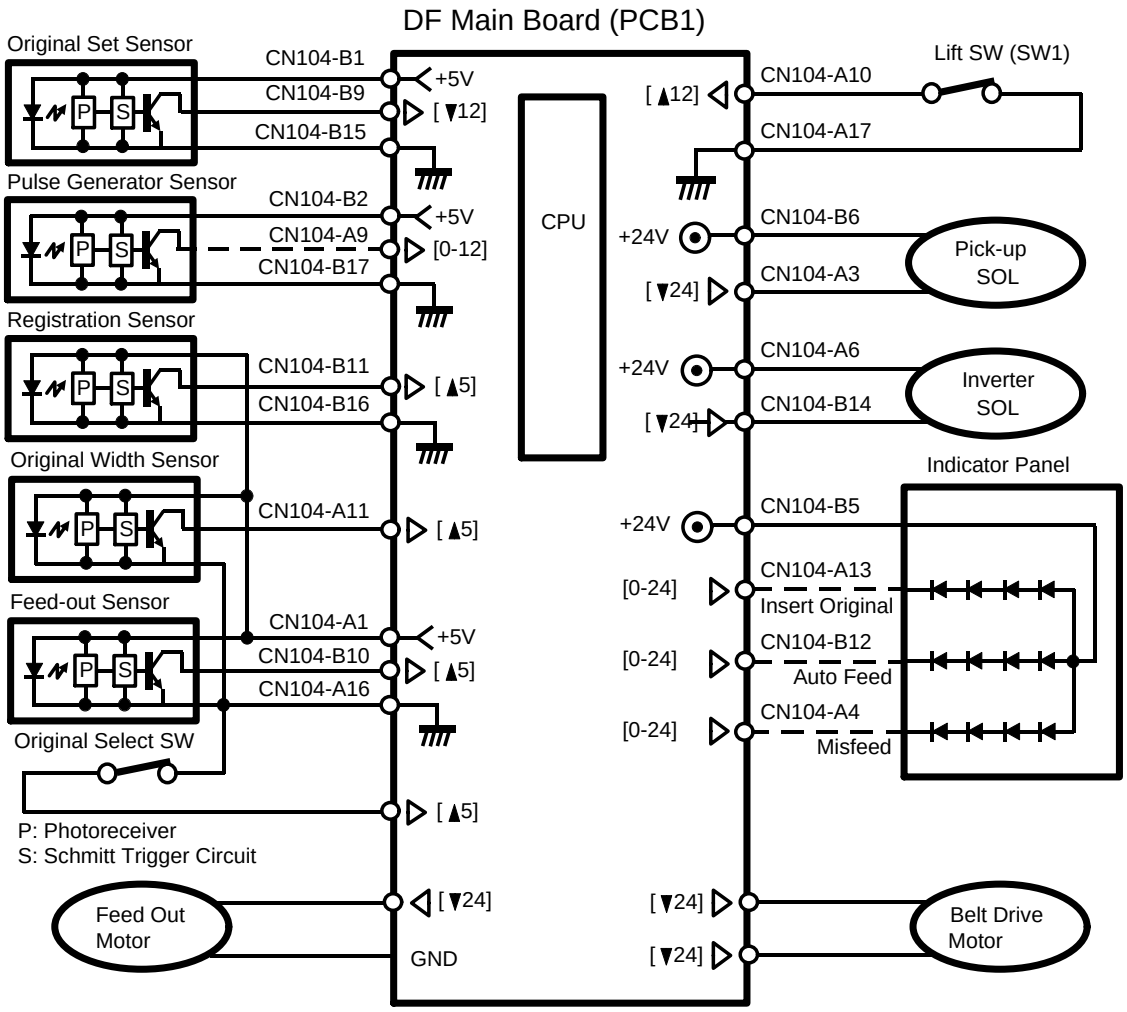
8.8 FEED-OUT MOTOR CIRCUIT



The DF CPU sends the speed data (high or low) to the driver IC and the motor drive circuit. The motor drive circuit creates the PWM signal and sends the motor drive pulses to the feed-out motor.

The frequency generator of the feed-out motor makes a very low voltage ac current which is fed back to the driver IC. The driver IC monitors the frequency of this ac current and based on the frequency it regulates the motor speed.

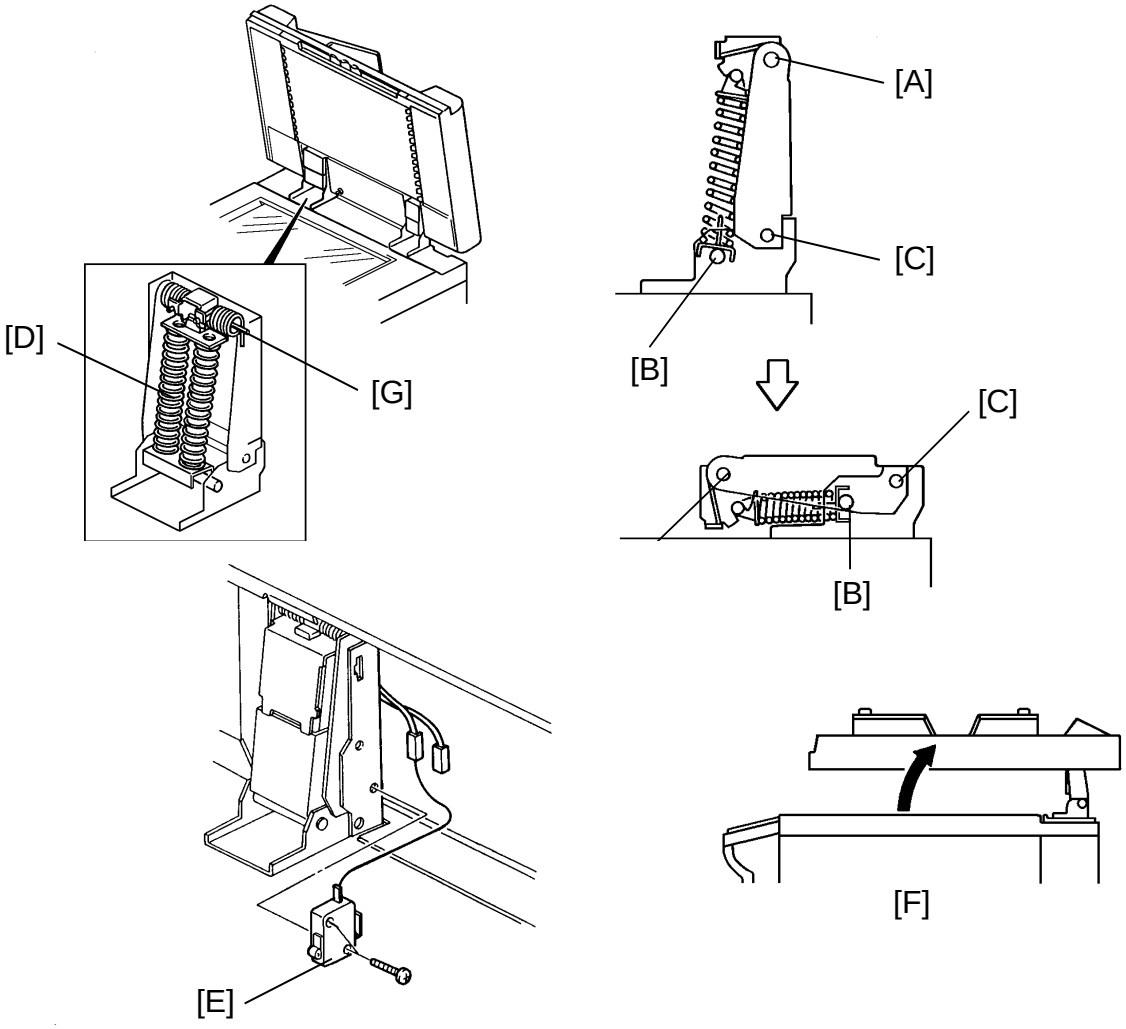
8.9 INPUT AND OUTPUT CIRCUITS



The above devices are directly controlled and monitored by the CPU. The solenoids and indicator panel are energized with +24 volts. The sensors and switches are energized with +12 volts or +5 volts.

To energize a solenoid or indicator, the CPU drops the connected trigger line from +24 volts to LOW. The CPU monitors the input lines of the sensors and switch to determine when they are activated.

9. LIFT MECHANISM



When the document feeder is opened, the lift springs [D] provide enough force to ensure that the document feeder does not fall onto the exposure glass. When the document feeder is closed, points "A", "B", and "C" are aligned and no such force is provided to the document feeder.

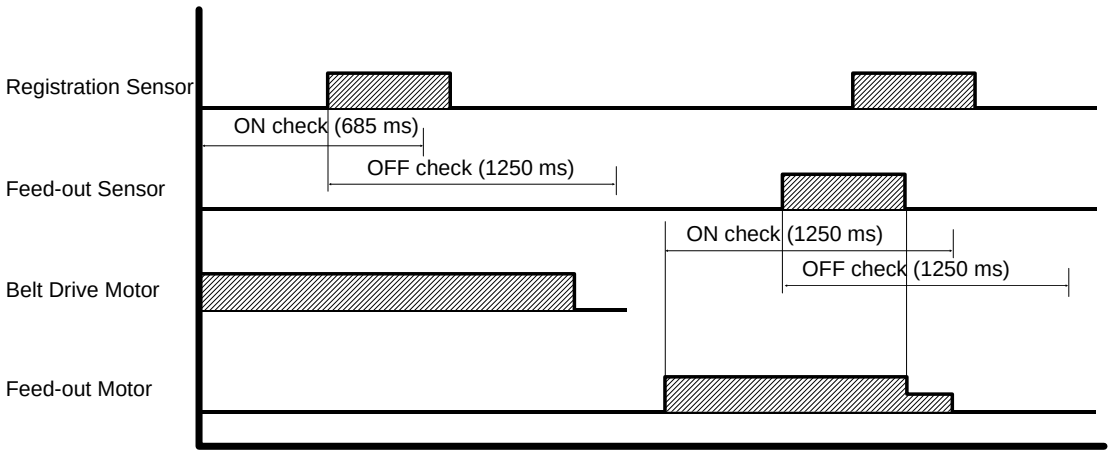
The lift switch [E] is actuated when the document feeder is closed. The copier then shifts to the document feeder mode. The lift switch also serves as the reset switch for document feeder misfeeds.

When a book or thick (maximum thickness 60 mm) original is copied, the DF acts as a cover for the original as shown in the figure [F]. The lift switch is turned off during this condition, so the DF does not function. The tension of spring [G] returns the DF to the normal condition after copying a thick original.

10. ORIGINAL MISFEED DETECTION

The registration sensor and the feed-out sensor are used for misfeed checks.

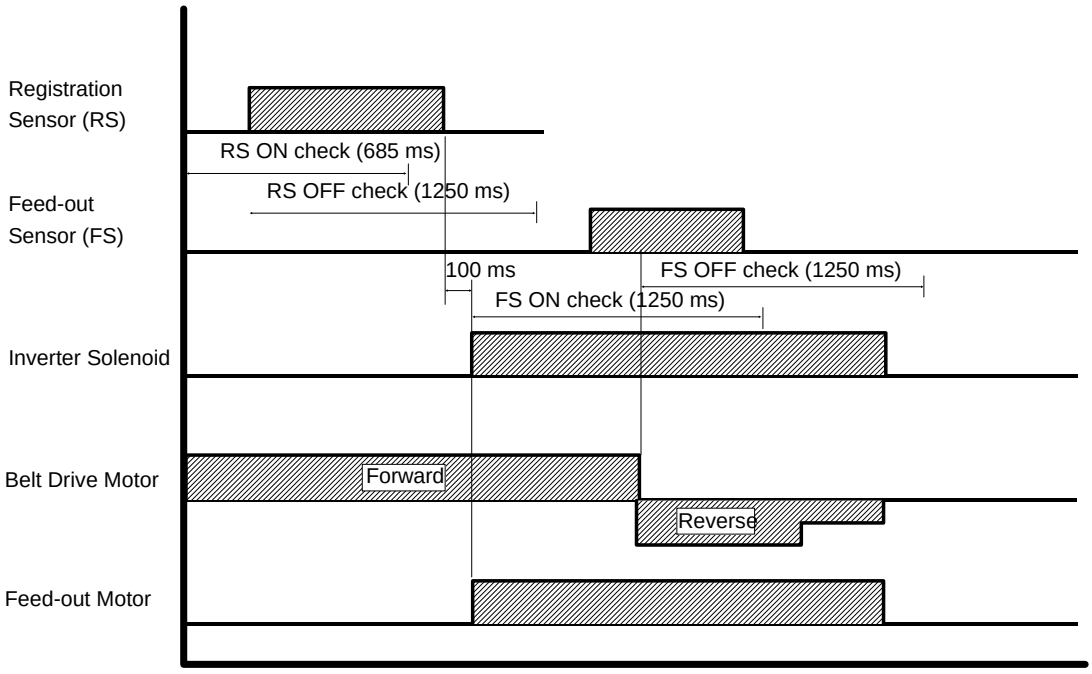
1. One sided original



If the registration sensor is not actuated within 685 milliseconds after the belt drive motor starts turning, the Original Misfeed indicator lights (ON check).

If the registration sensor does not turn off within 1,250 milliseconds, the CPU determines that there has been an original misfeed (OFF check). The Original Misfeed indicator also lights if the feed-out sensor is not actuated within 1,250 milliseconds after the feed-out motor starts turning (ON check) or if the feed-out sensor does not turn off within 1,250 milliseconds after the feed-out sensor is actuated (OFF check).

2. Two sided original



The registration ON/OFF check is the same as for one-sided originals. The inverter motor and the inverter solenoid turn on 100 milliseconds after the registration sensor turns off. If the feed-out sensor is not actuated within 1,250 milliseconds after the feed-out motor starts turning, the Original Misfeed indicator lights (ON check). The Original Misfeed indicator also lights if the feed-out sensor does not turn off within 1,250 milliseconds after the belt drive motor reverses (OFF check).

If a previous original remains on the exposure glass after manual copying and DF feed is attempted, the original misfeed indicator lights. When the DF is lifted and the previous original is removed, DF copying is permitted.

11. INSTALLATION PROCEDURE (for Machine Code: A048)

11.1 ACCESSORY CHECK

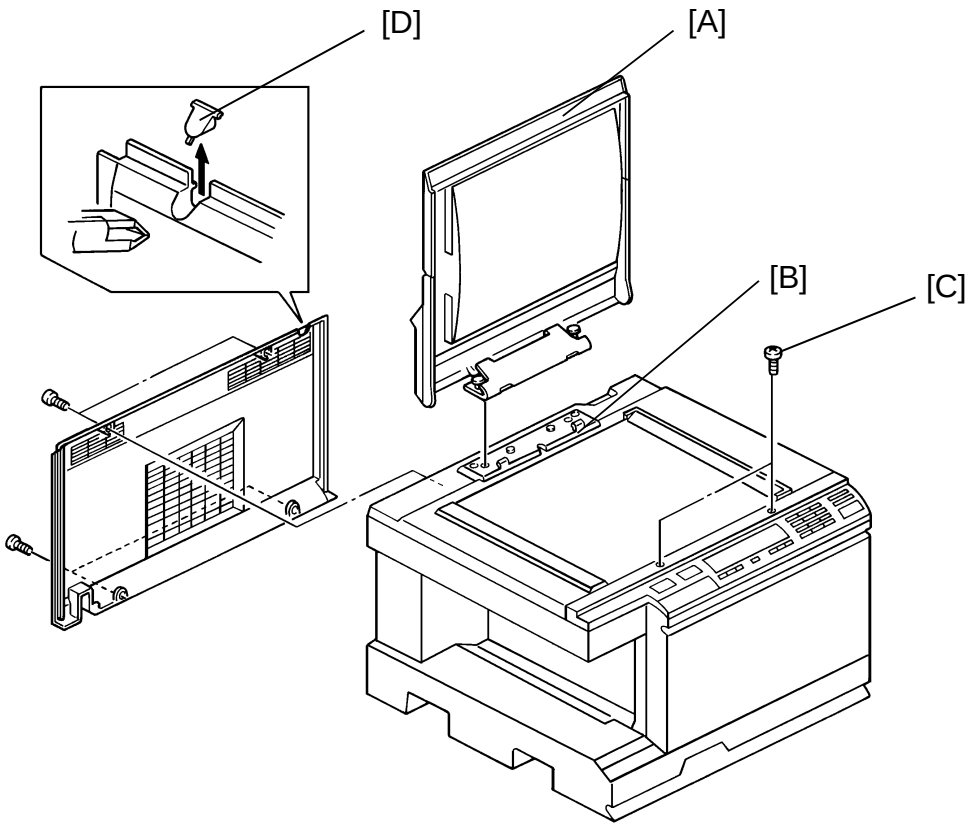
Check the quantity and condition of the accessories in the box according to the following list:

1. Original Table 1
2. DF Mounting Bracket 1
3. Angle Stopper 1
4. Lift Switch Actuator 1
5. E Plate 1
6. Spacer - 0.5 mm 6
7. Spacer - 0.2 mm 4
8. DF Harness Bracket 1
9. Bushing 1
10. Toothed Washer 1
11. Grounding Screw - M4 x 6 1
12. Hexagon Head Screw - M4 x 10 4
13. Philips Screw with Flat Washer - M4 x 5 4
14. Philips Pan Head Screw - M4 x 5 (round head) 3
15. Philips Pan Head Screw - M4 x 5 (flat head) 2
16. Philips Pan Head Screw - M3 x 5 1
17. Stud Screw 2
18. DF Test Chart 1

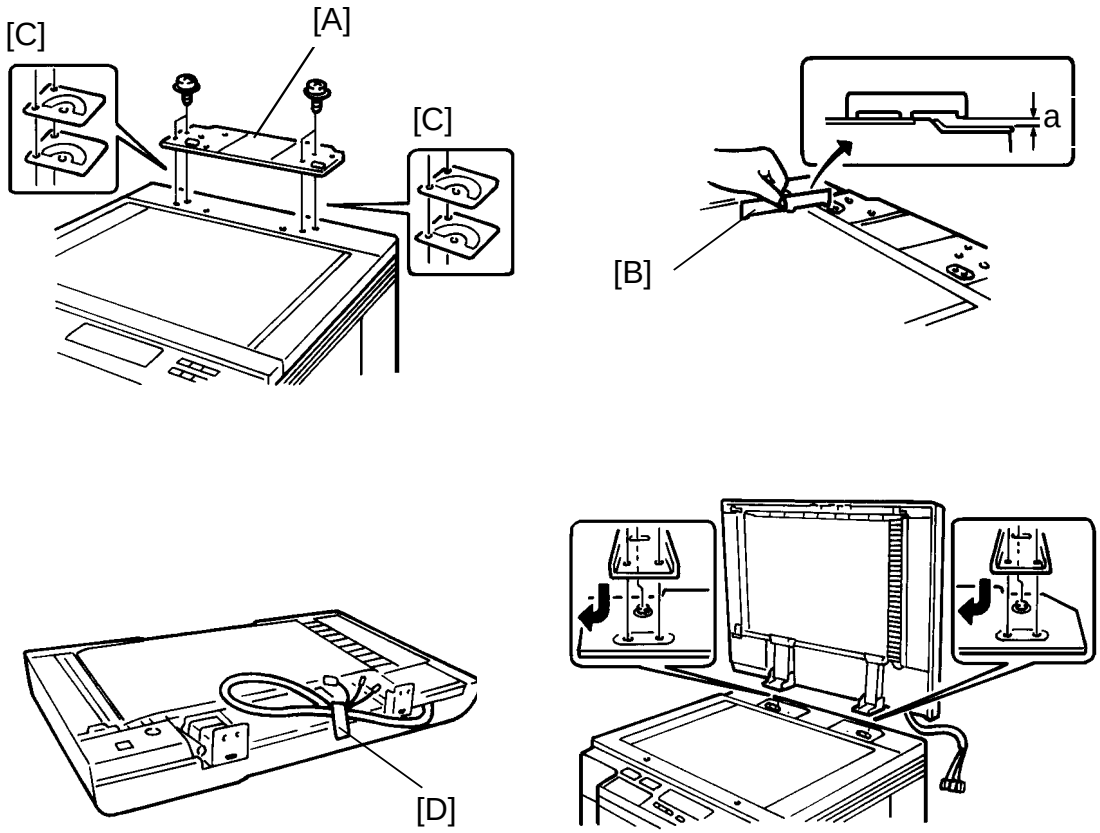
NOTE 1. When the document feeder is installed on the copier, the DC power supply unit (option) is required.

2. When installing the DC power supply unit, please refer to the installation procedure enclosed with it.

11.2 INSTALLATION PROCEDURE



1. Install the dc power supply unit.
2. Remove the following parts from the copier:
   1) Platen cover [A] (2 push-locks)
   2) Platen cover pedestal [B] (4 screws)
   3) 2 screws [C] for fixing the operation panel.
3. Remove the harness cap [D] on the rear cover with nippers.

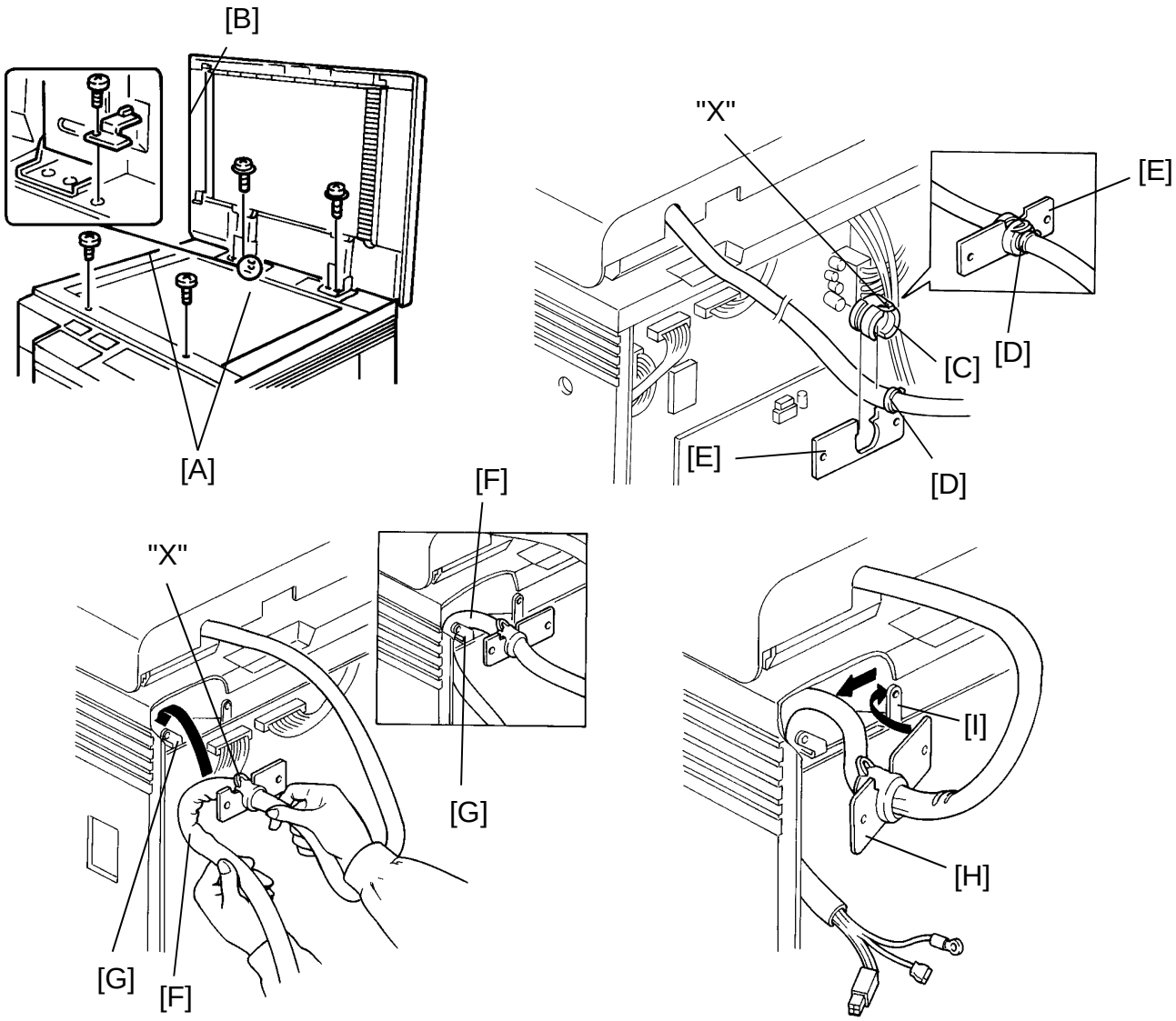


4. Secure the DF mounting bracket [A] (4 screws).

5. Adjust the height of the DF mounting bracket as explained below:
   1) Set the E plate [B] on the exposure glass as shown and measure the clearance "a" between the DF mounting bracket and the E plate with a scale.
   2) Remove the DF mounting bracket and insert spacers [C] until the clearance "a" is between 0 mm and 0.3 mm.

6. Remove the strip of tape [D].

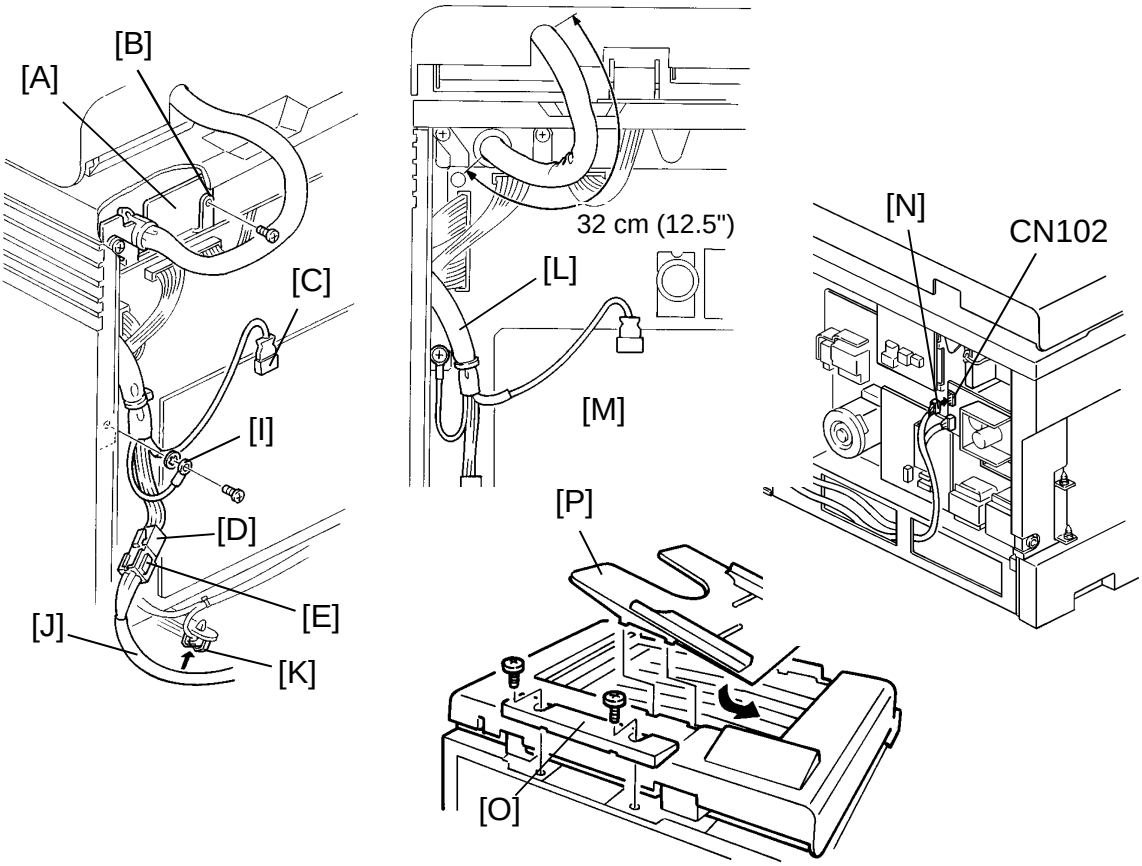
7. Mount the DF on the DF mounting bracket so that the holes in the DF are aligned with the pins on the mounting bracket, then slide the DF to the left as shown.



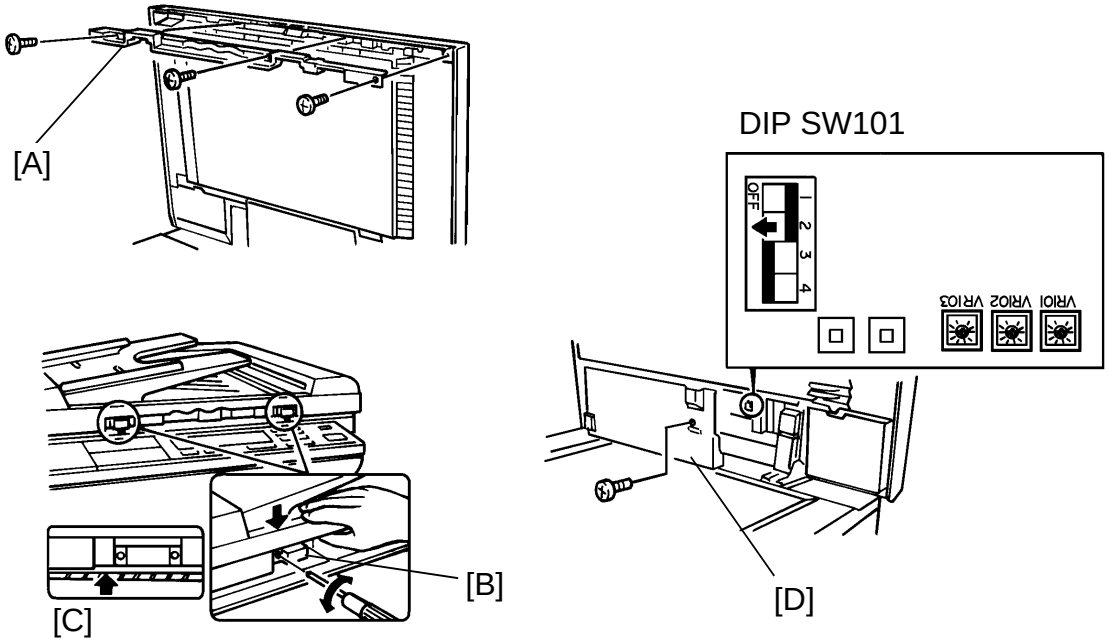
8. Secure the DF to the DF mounting bracket (4 screws).
9. Secure the 2 stud screws [A] as shown.
10. Install the lift switch actuator [B] (1 screw).
11. Place the bushing [C] at the left side of the binder [D] as shown.
12. Set the harness bracket [E] on the bushing.

NOTE: Make sure that the portion "X" of the bushing faces up.

13. Insert the DF harness [F] behind the harness support bracket [G].
14. Position the harness bracket [H] behind the harness support bracket [I] as shown.



15. Secure the harness bracket [A] to the harness support bracket [B] (2 screws).
16. Connect the optic cable connector (2P/Black) [C] to CN206 on the interface board.
17. Connect the DC harness connector (4P/White) [D] to the optional harness connector [E].
18. Secure the grounding wire [I] (1 screw and toothed washer).
19. Set the optional harness [J] into the clamp [K] on the main board support bracket. (This bracket is located on the lower side of the main board.)
20. Make sure that the DF harness [L] does not pass over the interface board [M].
    NOTE: Make sure that at least 32 cm (12.5") of the DF harness extends out of the copier as shown.
21. Connect the harness connector [N] to CN102 on the DC power supply unit.
22. Install the angle stopper [O] (2 screws).
23. Install the original table [P].



24. Adjust the height of the magnet catches as follows:
    1) Remove the grip cover [A] (3 screws).
    2) Loosen the screws of the magnet catches [B] (2 screws for each catch).
    3) Close the document feeder and tighten the screws of the magnet catches when the rubber stopper [C] contacts the exposure glass.

25. Remove the DF main PCB cover [D] and turn off DIP switch 101-2.

NOTE: Make sure that DIP switch 101-1 is on and the other switches (101-2, 3, and 4) are off.

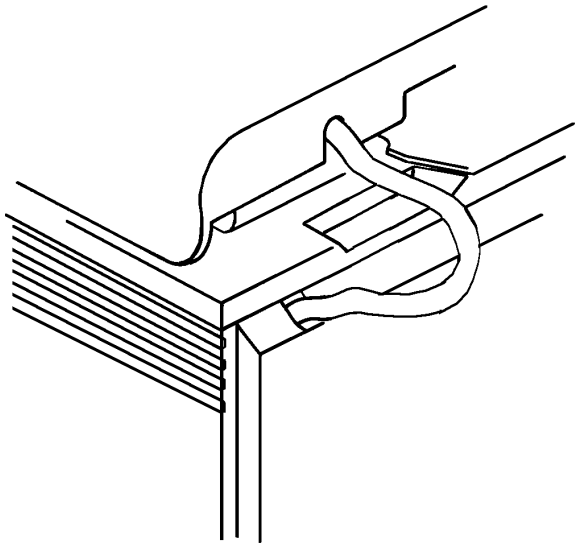
26. Reinstall the grip cover (3 screws).

NOTE: Open and close the document feeder to confirm that the magnet catches are making good contact.

27. Plug in the copier and turn on the main switch.

28. Confirm the original registration as follows:
    1) Make a copy of the test sheet in platen mode (A4 width).
    2) Confirm that the original select switch is set to thin paper mode and make a copy in DF mode (A4 width).
    3) Compare the registration of the copy in platen mode with that of DF mode, and confirm that the difference is within 2.5 mm.
    4) If the difference is more than 2.5 mm, remove the DF main PCB cover and adjust VR102 to change the original-stop timing.

NOTE: Turning VR102 clockwise results in the original stopping later.



5) Make a copy of the test sheet in DF two-sided original mode.

NOTE: 1. The test sheet must be set facedown.

2. The original select switch can be set at any position.

6) Compare the registration of the copy in platen mode with that of DF two-sided original mode, and confirm that the difference is within 2.0 mm.

7) If the difference is more than 2.0 mm, remove the DF main PCB cover and adjust VR103 to change the original-stop timing.

NOTE: 1. The test sheet should stop pressed against the left scale in DF two-sided original mode.

2. Turning VR103 clockwise results in the original stopping later.

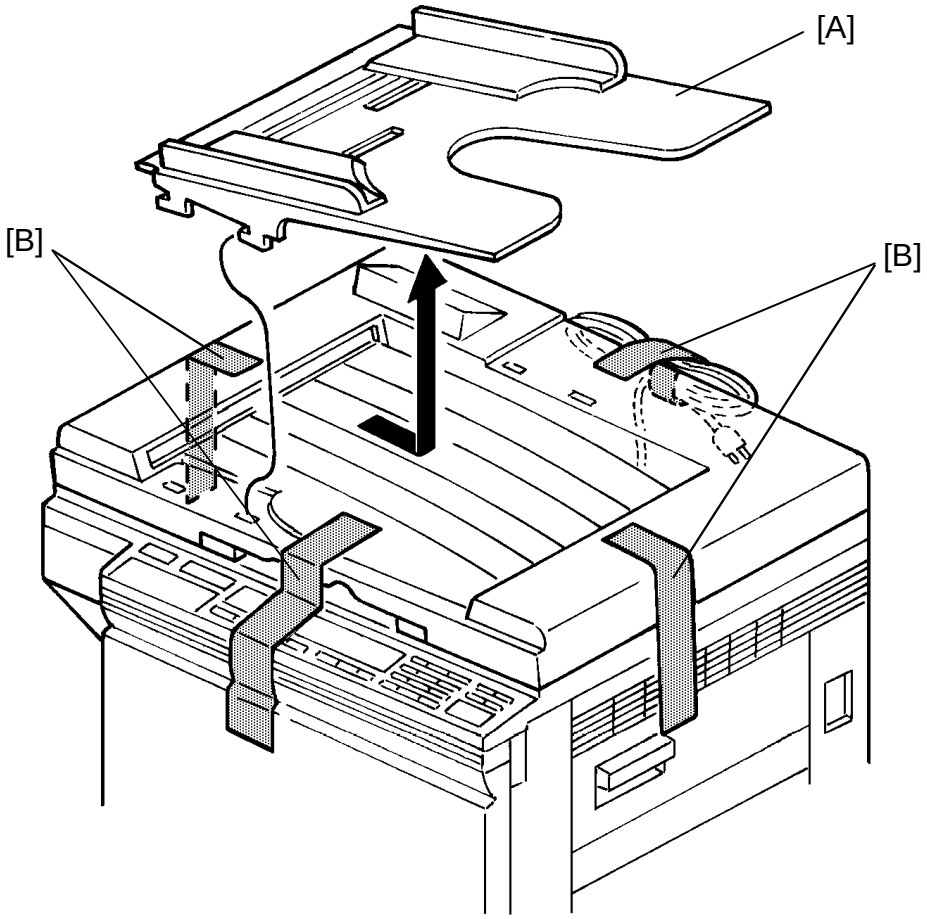
29. Reassemble the copier. (The DF harness fits in the cut-out on the rear cover as shown.)

30. Check the operation of the DF.

31. Position the original select switch to thin original mode (normal position) and explain the function of this switch to the customer.

12. PREPARATION FOR TRANSPORTATION

CAUTION: Before moving the document feeder, be sure to prepare it for transportation as follows. The document feeder may be badly damaged if it is moved without proper preparation.

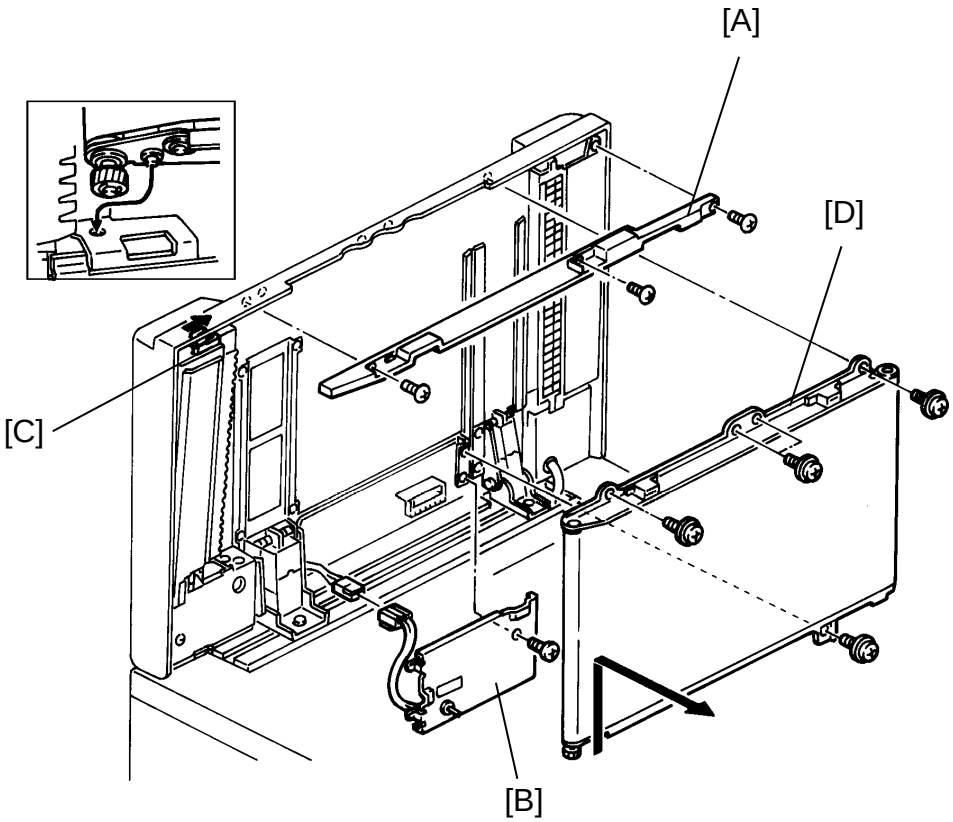


1. Remove the original table [A].
2. Secure the document feeder with strips of tape [B] as shown in the illustration.

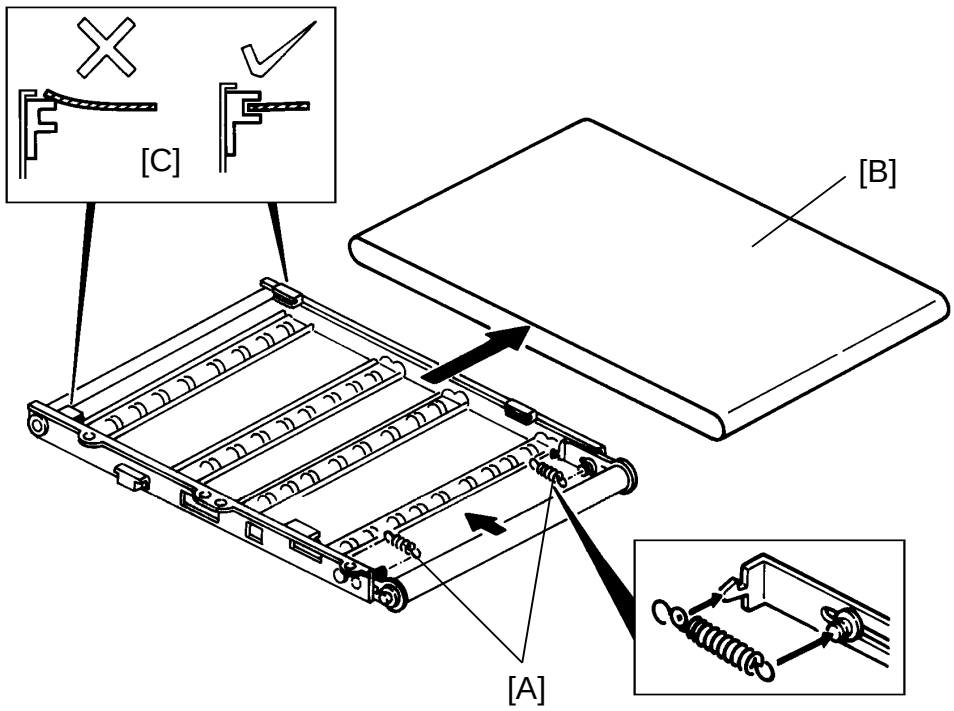
13. REPLACEMENT AND ADJUSTMENT

13.1 FEED-IN UNIT

13.1.1 Transport Belt Replacement



1. Turn off the main switch and remove the grip [A] (3 screws).
2. Remove the DF main PCB cover [B] (1 screw, 1 connector).
3. Open the entrance guide [C] and remove the transport belt assembly [D] (5 screws).

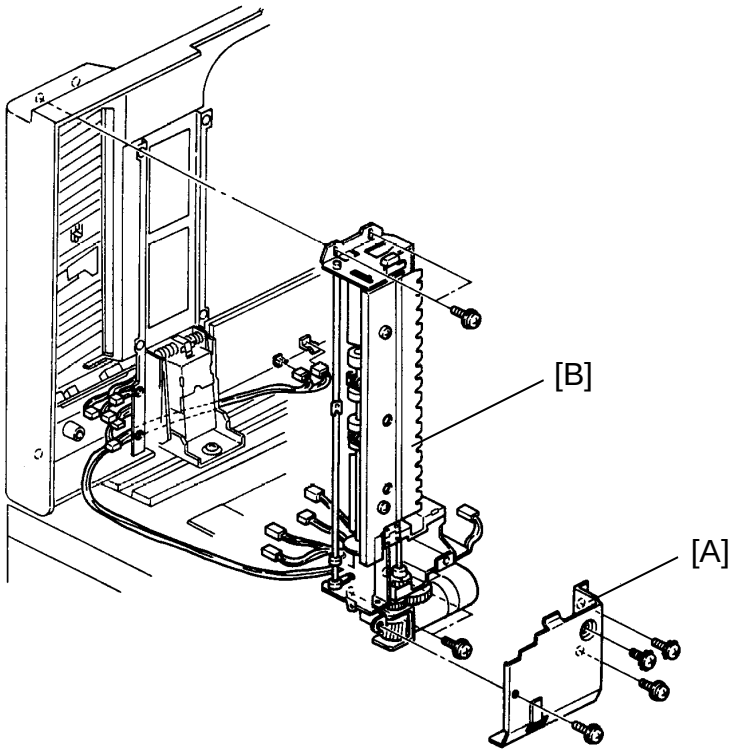


4. Remove the 2 tension springs [A] and pull off the transport belt [B].

NOTE: a) When installing the transport belt, make sure the belt lies between the belt guide spacers [C].

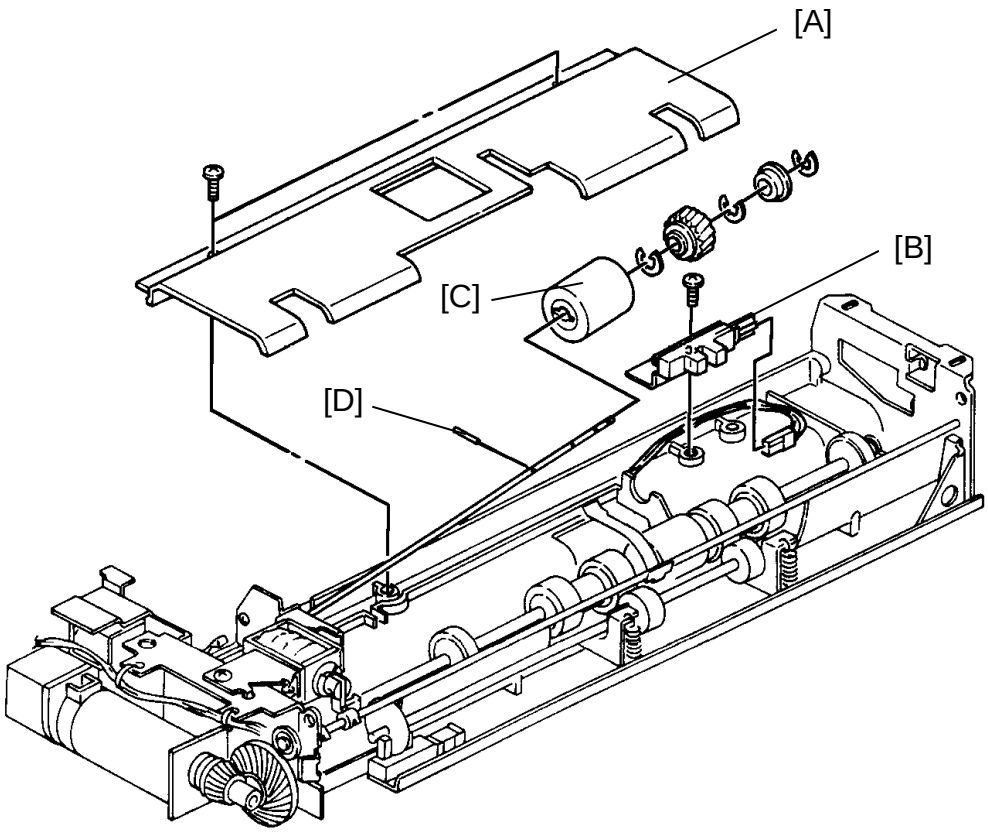
b) When installing the transport belt assembly, make sure the positioning pin correctly fits in the DF frame, and hold open the exit guide to prevent the mylar strip from becoming damaged.

13.1.2 Feed-in Unit Removal



1. Turn off the main switch.
2. Remove the transport belt assembly. (See Transport Belt Replacement.)
3. Remove the belt drive motor cover [A] (4 screws).
4. Remove the feed-in unit [B] (4 screws, 8 connectors).

13.1.3 Pick-up Roller Replacement*



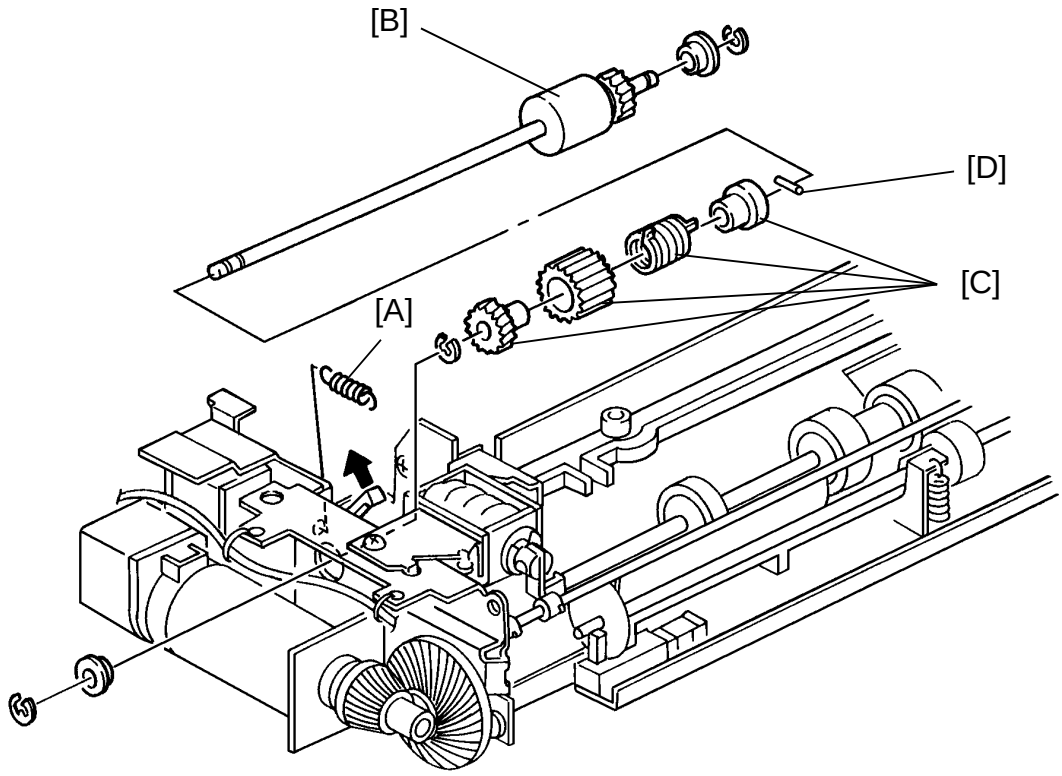
1. Turn off the main switch.
2. Remove the feed-in unit. (See Feed-in Unit Removal.)
3. Remove the lower entrance guide [A] (2 screws).
4. Remove the original set sensor assembly [B] (1 screw, 1 connector).
5. Remove the pick-up roller [C] (3 E-rings, 1 bushing, 1 gear).

NOTE: a) Be careful not to loose the pin [D].

b) When installing the roller, make sure the positioning pin is correctly inserted in the cut-out of the roller.

c) When installing the gear, make sure the flat side of the gear is facing away from the roller.

13.1.4 Feed-in Clutch Lubrication

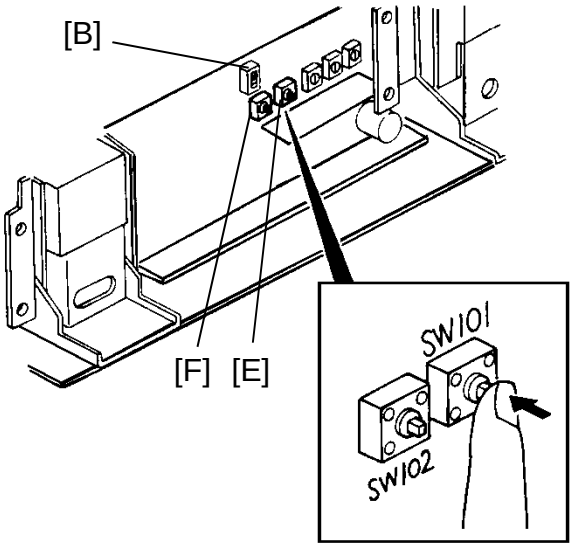


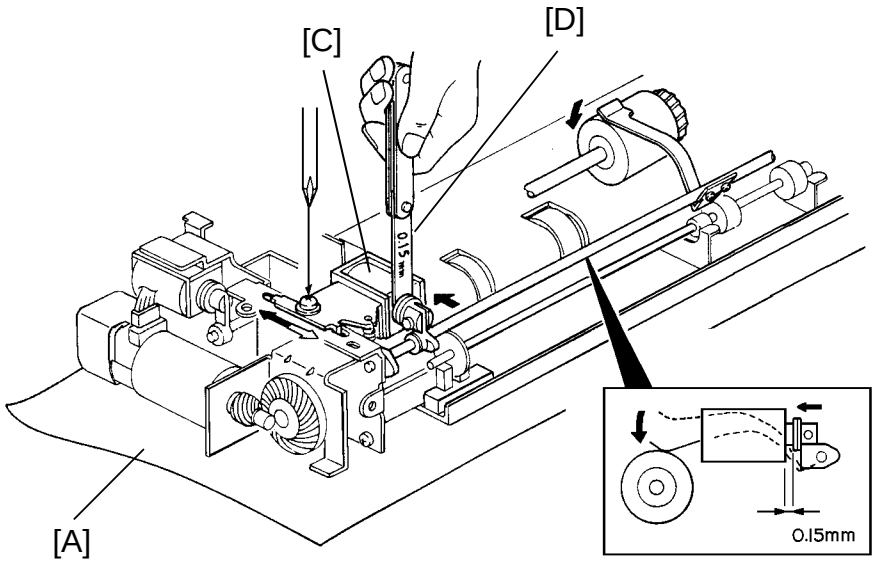
1. Turn off the main switch.
2. Remove the original set sensor assembly. (See Pick-up Roller Replacement.)
3. Remove the feed-in solenoid lever spring [A].
4. Remove the pick-up roller assembly [B] (2 E-rings, 2 bushings).
5. Disassemble and lubricate the feed clutch [C] (1 E-ring) with Mobil Temp. 78.

NOTE: a) Be careful not to loose the pin [D].

b) When installing the feed clutch, make sure the positioning pin is correctly inserted in the cut-out of the clutch.

13.1.5 Pick-up Solenoid Adjustment





1. Turn off the main switch.
2. Place several sheets of paper [A] over the exposure glass area.
3. Lower the feed-in unit (See Feed-in Unit Removal) without disconnecting the eight connectors.

Continued on the next page

4. Turn on the main switch.

NOTE: When the main switch is turned on, the DPS101 setting on the DF main PCB must be as follows:

1 = ON 3 = OFF
2 = ON 4 = OFF

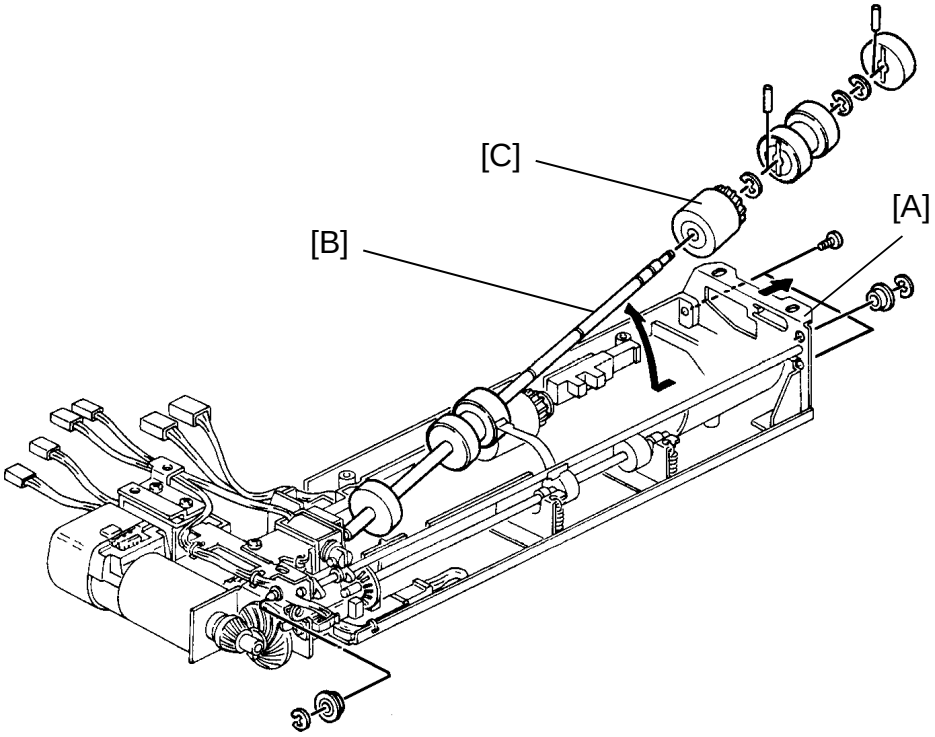
This is so that the initial check sequence can take place.

5. Turn off DPS101-1 and 2, then turn on DPS101-3 and 4 [B].
6. Loosen the screw fixing the pick-up solenoid [C].
7. Place the 0.15 mm thickness gauge [D] between the plunger and the solenoid.
8 While holding the solenoid, press SW101 [E] on the DF main PCB to engage all DF solenoids.
9. Holding the solenoid securely, move it slowly towards the left, until the plunger is attracted to the solenoid. Just at this point, tighten the screw.

NOTE: Make sure the pick-up lever is touching the pick-up roller during this adjustment.

10. Press SW 102 [F] to turn off the solenoids.
11. Turn off DPS101-3 and 4, then turn on DPS101-1 and 2.
12. Turn off the main switch and reassemble the DF.
13. Check the original feed-in operation.

13.1.6 Feed Roller Replacement -



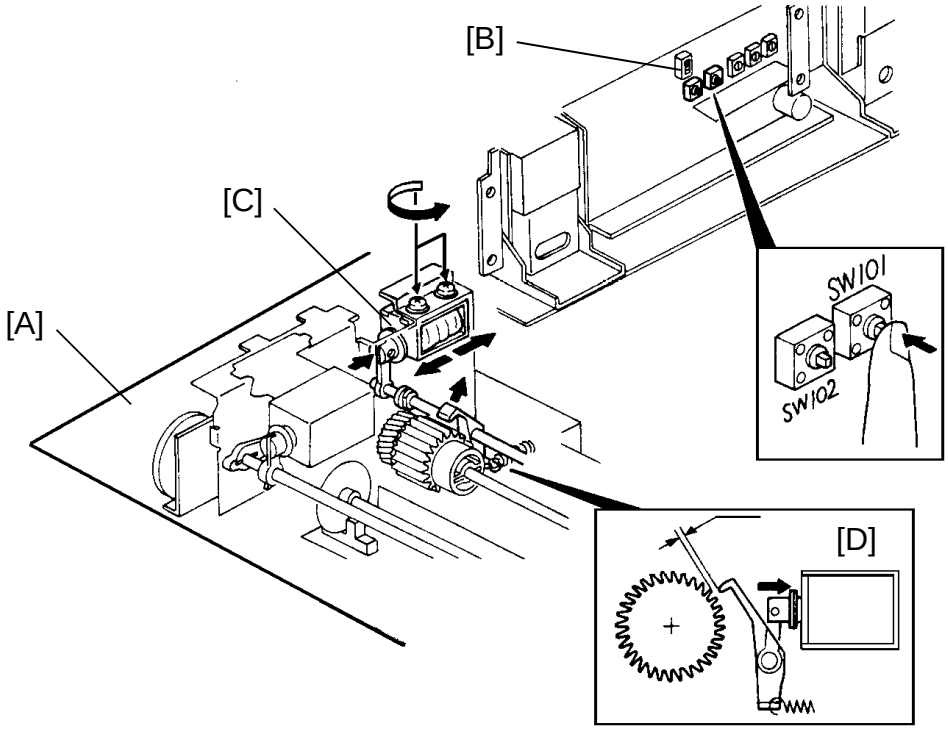
1. Turn off the main switch.
2. Remove the lower entrance guide. (See Pick-up Roller Replacement.)
3. Loosen the front bracket [A] (2 screws).
4. Release the feed roller shaft [B] from the front bracket (1 E-ring, 1 bearing).
5. Remove the feed roller [C] (3 E-rings, 1 side roller, 1 pull-out roller).

NOTE: a) Take care not to lose the pins.

b) When installing the feed roller, make sure the gear side of the roller faces the front (See illustration).

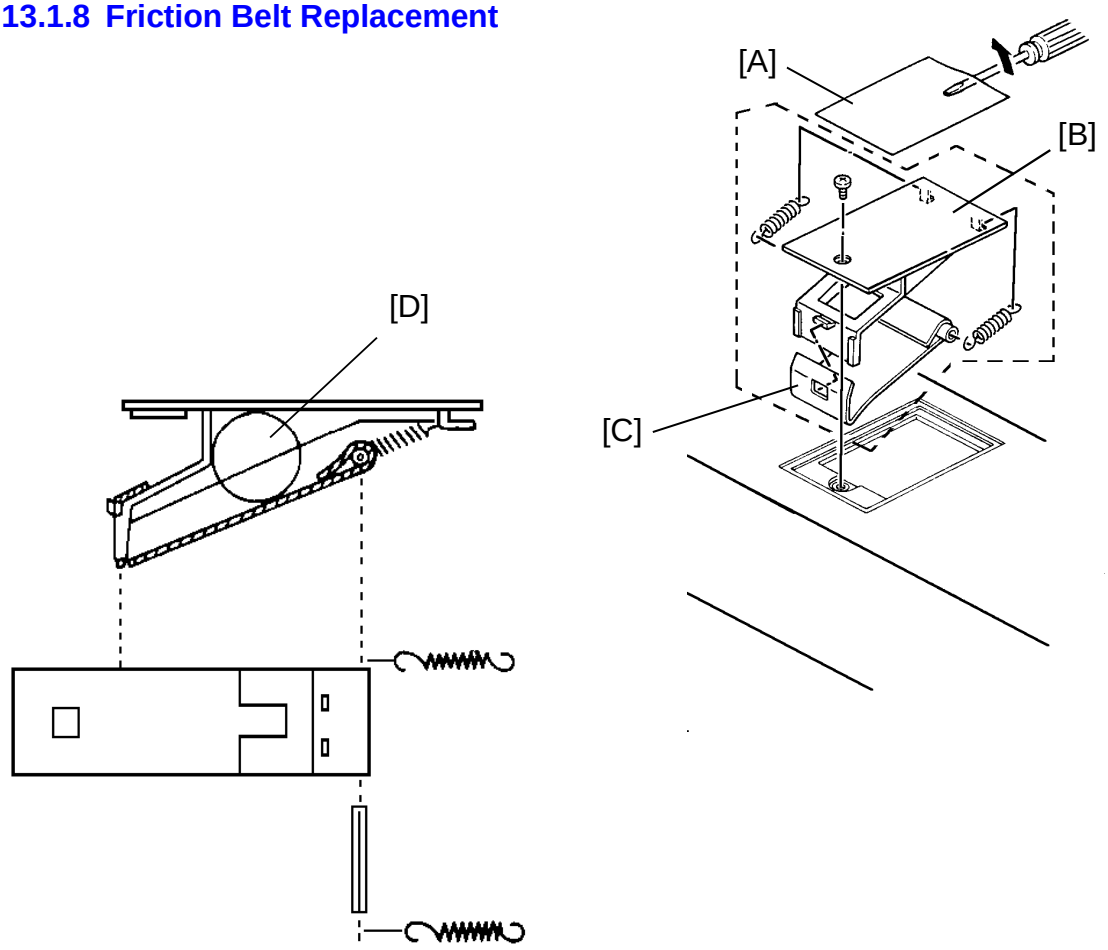
c) When installing the side and pull-out rollers, make sure the pins are correctly inserted in the cut-outs of the rollers.

13.1.7 Feed-in Solenoid Adjustment



1. Turn off the main switch.
2. Place several sheets of paper [A] over the exposure glass area.
3. Lower the feed-in unit (See Feed-in Unit Removal) without disconnecting the eight connectors.
4. Check that DPS101 is set for the normal mode (1 = ON, 2 = ON, 3 = OFF, 4 = OFF).
5. Turn on the main switch.
6. Turn off DPS101-1 and 2, then turn on DPS101-3 and 4 [B].
7. Loosen the 2 screws securing the feed-in solenoid [C].
8. Press SW101 on the DF main PCB (to engage all DF solenoids) and adjust the position of the solenoid until the gap [D] (See illustration) is within 1.0 – 2.0 mm.
9. Press SW102 on the DF main PCB to turn off all DF solenoids.
10. Turn off DPS101-3 and 4, then turn on DPS101-1 and 2.

13.1.8 Friction Belt Replacement



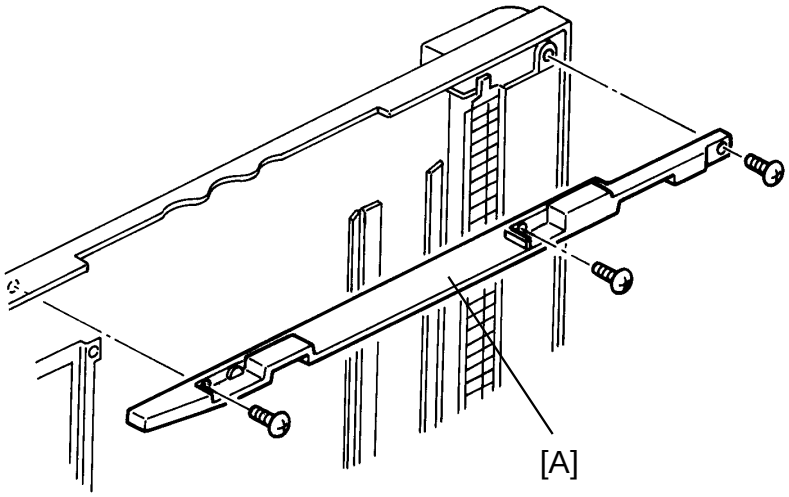
1. Turn off the main switch.
2. Remove the seal cover [A] on top of the DF cover.
3. Remove the friction belt assembly [B] (1 screw).
4. Remove the friction belt [C] (2 springs, 1 pin).

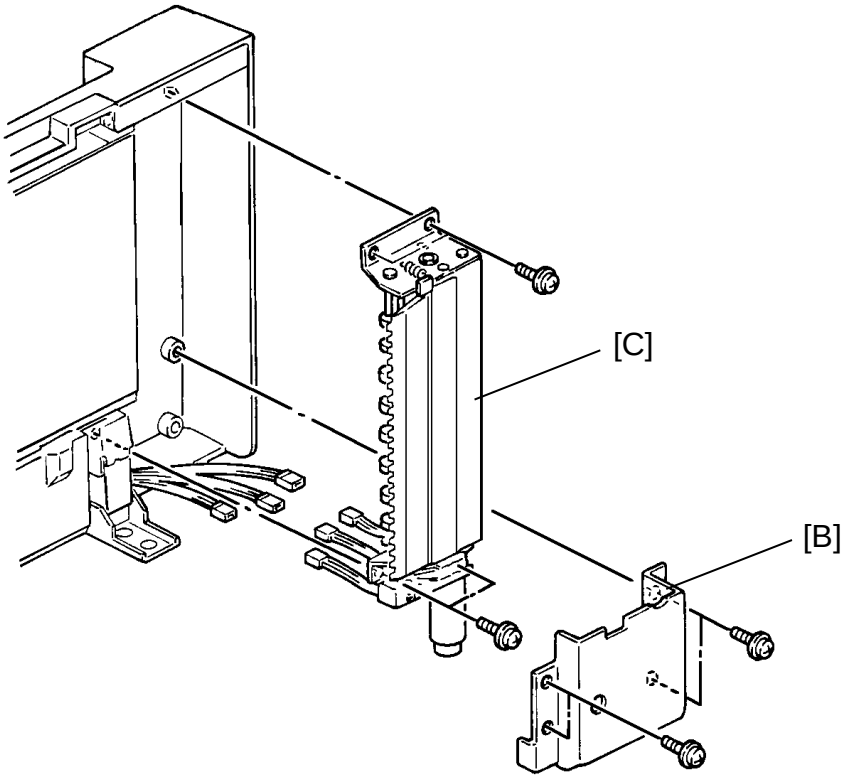
NOTE: a) When installing the friction belt assembly, make sure the friction roller [D] is set in the correct position (See illustration).

b) If the seal cover becomes dirty or deformed, replace it with a new one.

13.2 FEED-OUT UNIT

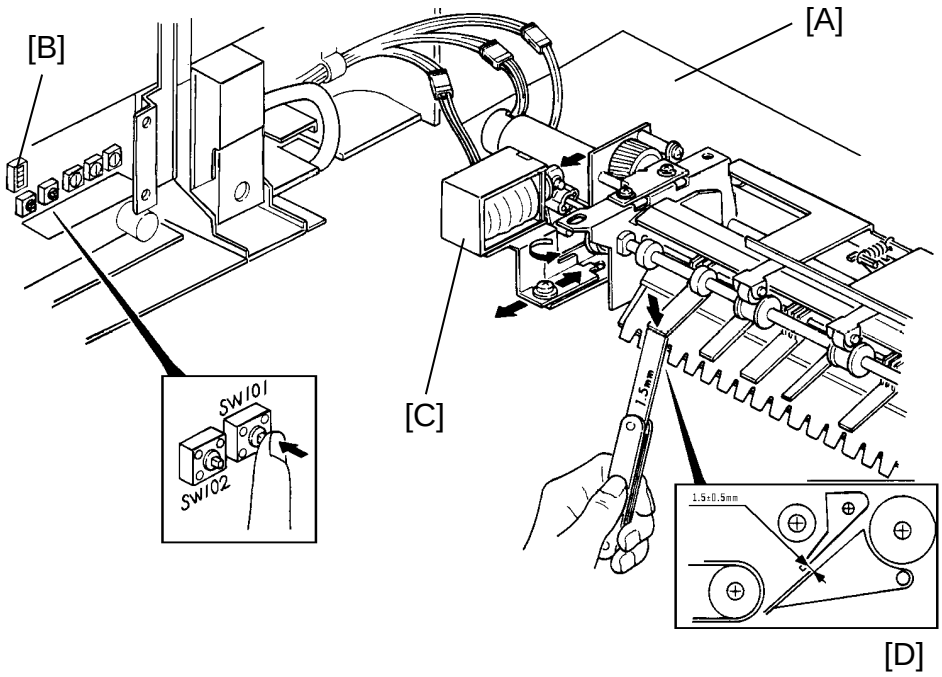
13.2.1 Feed-out Unit Removal





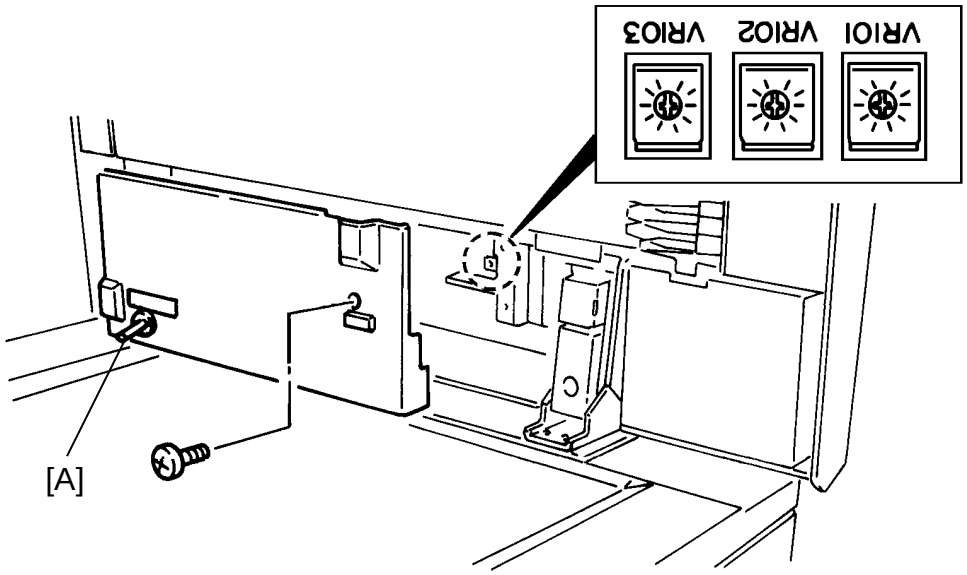
1. Turn off the main switch.
2. Remove the DF grip [A] (3 screws).
3. Remove the feed-out motor cover [B] (4 screws).
4. Remove the feed-out unit [C] (4 screws, 3 connectors).

13.2.2 Inverter Solenoid Adjustment



1. Turn off the main switch.
2. Place several sheets of paper [A] over the exposure glass area.
3. Lower the feed-out unit (See Feed-out Unit Removal) without disconnecting the three connectors.
4. Check that the DPS101 is set for the normal mode (1 = ON, 2 = ON, 3 = OFF, 4 = OFF).
5. Turn on the main switch.
6. Turn off DPS101-1 and 2, then turn on DPS101-3 and 4 [B].
7. Loosen the screw securing the inverter solenoid [C].
8. Press SW101 on the DF main PCB (to engage all DF solenoids), and adjust the position of the solenoid until the gap [D] (See illustration) is within 1.5 ±0.5 mm.
9. Press SW102 on the DF main PCB to turn off all DF solenoids.
10. Turn off DPS101-3 and 4, then turn on DPS101-1 and 2.

13.2.3 DF Leading Edge Registration Adjustment



1. Using the DF test chart, make a copy in the platen cover mode (A4 width).
2. Confirm that the original select switch [A] is in the thin mode and again using the test chart, make a copy in the DF mode (A4 width).
3. Compare the leading edge registration of both copies, and check that the difference between the two copies is within 2.5 mm.

4. If the difference is more than 2.5 mm, remove the DF main PCB cover (1 screw) and adjust VR102 on the DF main PCB until the leading edge registration is within specification.

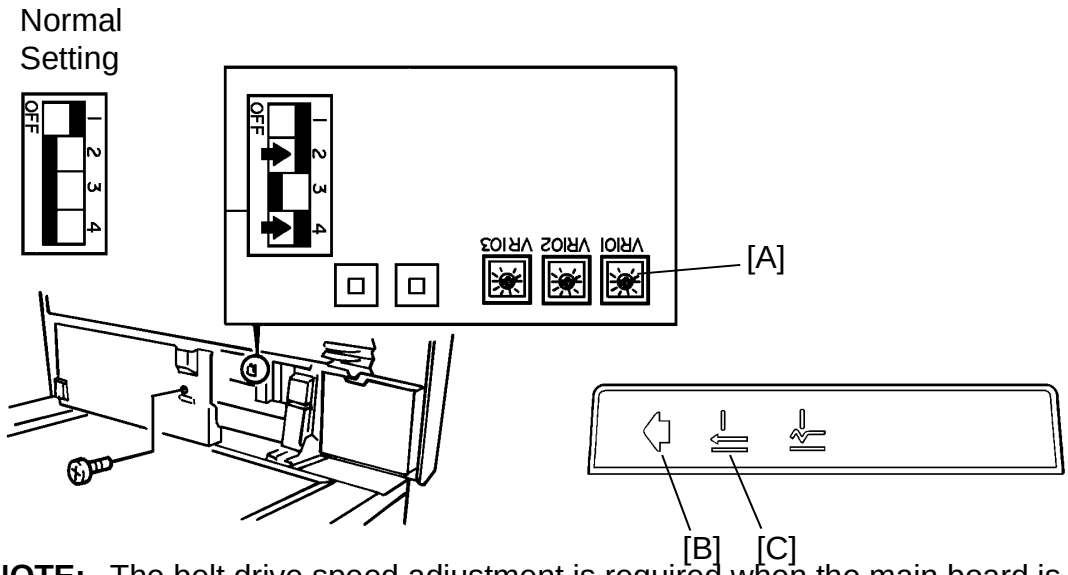
NOTE: Turning VR102 clockwise results in stopping the original later.

5. Using the DF test chart, make a copy in the DF two sided-original mode. (Insert the original face down.)
6. Compare the leading edge registration with that of the platen cover mode copy, and check that the difference between the two copies is within 2.00 mm.
7. If out of specification, adjust VR103 on the DF main PCB until the leading edge registration is correct.

NOTE: a) The test sheet stops pressed against the left scale in DF two-sided original mode.

b) Turning VR103 clockwise results in the original stopping later.

13.3 BELT DRIVE MOTOR SPEED ADJUSTMENT



NOTE: The belt drive speed adjustment is required when the main board is replaced.

1. Turn off the main switch.
2. Check that DIP switch 101 is set for the normal setting as follows:

101-1	101-2	101-3	101-4
ON	OFF	OFF	OFF

3. Turn on the main switch and DIP switch 101-2 and -4.
4. While turning on the lift switch manually, adjust the belt drive motor speed using VR 101 [A] so that both the Insert Original indicator [B] and Auto Feed indicator [C] turn off.

NOTE: a) When the Insert Original indicator lights, turn VR 101 clockwise to reduce the motor speed.

b) When the Auto Feed indicator lights, turn VR 101 counterclockwise to increase the motor speed.

c) Confirm that both indicators remain off for approximately 5 seconds in order to stabilize the motor speed.

5. Turn off DIP switch 101-2 and -4.

NOTE: Do not use VR 106. This variable resistor is for adjusting feed-out motor speed. This is preset by the vendor.

SECTION 9

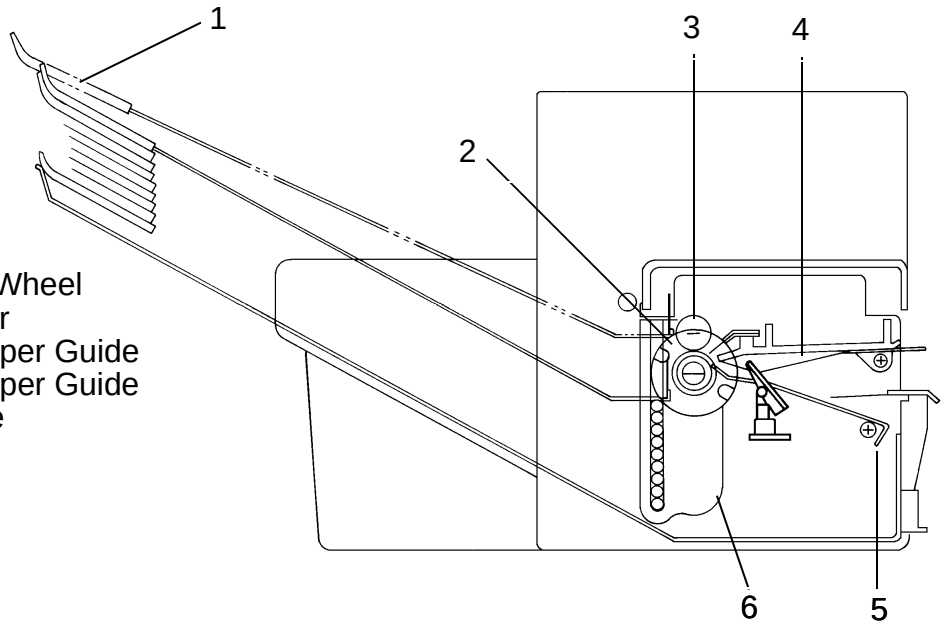
SORTER

1. SPECIFICATIONS

Number of Bins:	10 bins	
Paper Size for Bins:	Maximum	A3, 11" x 17"
	Minimum	A6, 5 1/2" x 8 1/2" (Lengthwise)
Paper Weight:	64 to 90 g/m2 (17 to 24 lb)	
Bin Capacity:	Sort/Stack Mode	20 sheets / A4, 8 1/2" x11"
		15 sheets / B4, 8 1/2" x 14"
		10 sheets / A3, 11" x 17"
Top Bin Capacity: (Non-Sort/Stack Mode)	100 sheets (all sizes)	
Power Source:	+5 volts and +24 volts from the copier	
Power Consumption:	7.7 W	
Dimensions: (W x D x H)	440 mm x 391 mm x 367 mm (17.3" x 15.4" x 14.4")	
Weight:	7.5 kg (16.5 lb).	

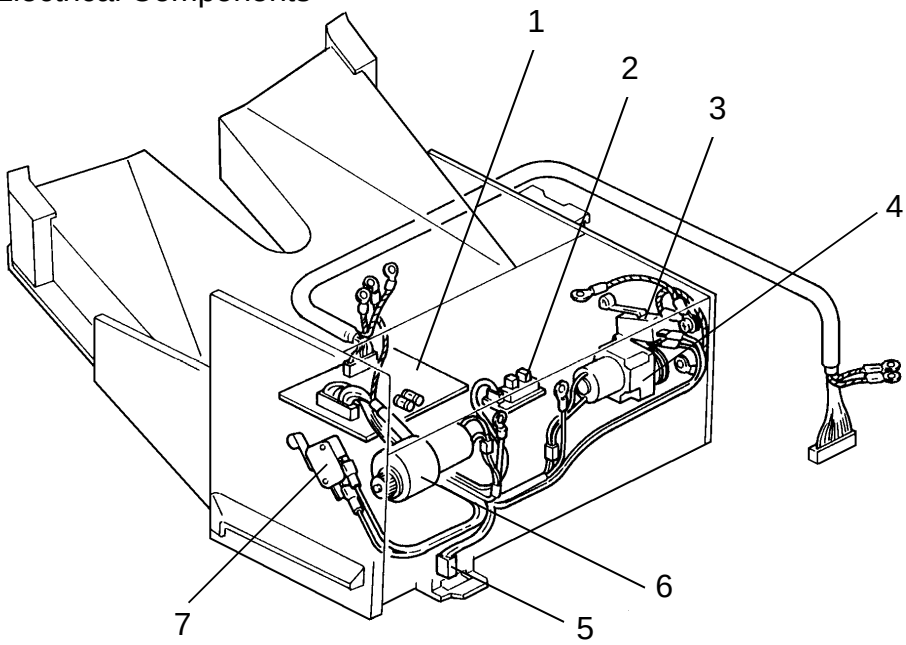
2. COMPONENT LAYOUT

— Mechanical Components —



1. Bin
2. Transfer Wheel
3. Exit Roller
4. Upper Paper Guide
5. Lower Paper Guide
6. Bin Guide

— Electrical Components —

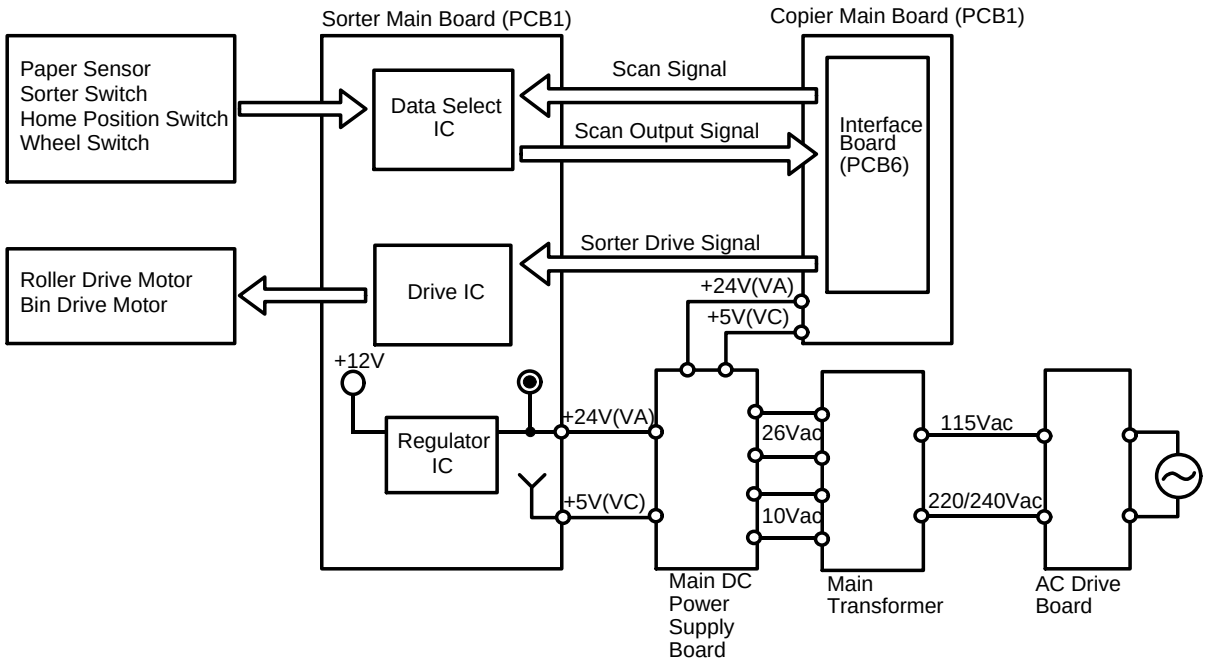


1. Sorter Main Board
2. Paper Sensor
3. Wheel Switch
4. Roller Drive Motor
5. Sorter Switch
6. Bin Drive Motor
7. Home Position Switch

3. ELECTRICAL COMPONENT DESCRIPTIONS

Symbol	Name	Function	Location
Motors			
M1	Roller Drive Motor	DC motor that energizes to drive the lower exit rollers.	4
M2	Bin Drive Motor	Reversible DC motor that energizes to move the bins up or down.	6
Switches			
SW1	Wheel Switch	Detects the rotation of the transfer wheel and stops it in the correct position.	3
SW2	Sorter Switch	Reed switch that becomes activated when the sorter is in the proper position (aligned next to the copier). Also works as a jam reset switch for the sorter.	5
SW3	Home Position Switch	Informs the CPU that all the bins are lowered.	7
Sensors			
S1	Paper Sensor	Serves as the misfeed sensor for the sorter and also sets exit roller and bin drive timing.	2
Printed Circuit Boards			
PCB1	Sorter Main Board	Serves as the communication board between the copier main board and the sorter.	1

4. OVERALL MACHINE CONTROL



The main DC power supply board provides +24 volts (VA) and +5 volts (VC) to the sorter main board. +24 volts powers the roller drive motor, and +5 volts powers all sensors and switches. Also, +24 volts is changed to +12 volts by the regulator IC, which powers the bin drive motor.

The copier main board controls the drive and checks the status of the sorter via the sorter main board and the interface board. The interface board sends the scan signals to the data selected IC on the main board according to the signal from the copier main board. After receiving the scan signals, the data select IC outputs the status of the sensor and switches as the scan output signal.

The interface board also sends the sorter drive signal to the drive IC on the sorter main board according to the signal from the copier main board. After receiving the drive signal, the drive IC turns on the appropriate motors.

5. BASIC OPERATION

- Clear Mode -

When the main switch of the copier is turned on, the sorter automatically assumes the clear mode. In this mode, all copies are stacked on the first bin. The sorter also assumes the clear mode when either the interrupt mode or the manual feed mode is selected.

Sorter operation begins when a copy actuates the copier exit sensor. At this time, the roller drive motor energizes. When the paper exits onto the sorter bin, the paper sensor is de-activated and the roller drive motor is then de-energized. The copier main board monitors the paper sensor through the sorter main board to check for paper misfeeds.

- Sort Mode -

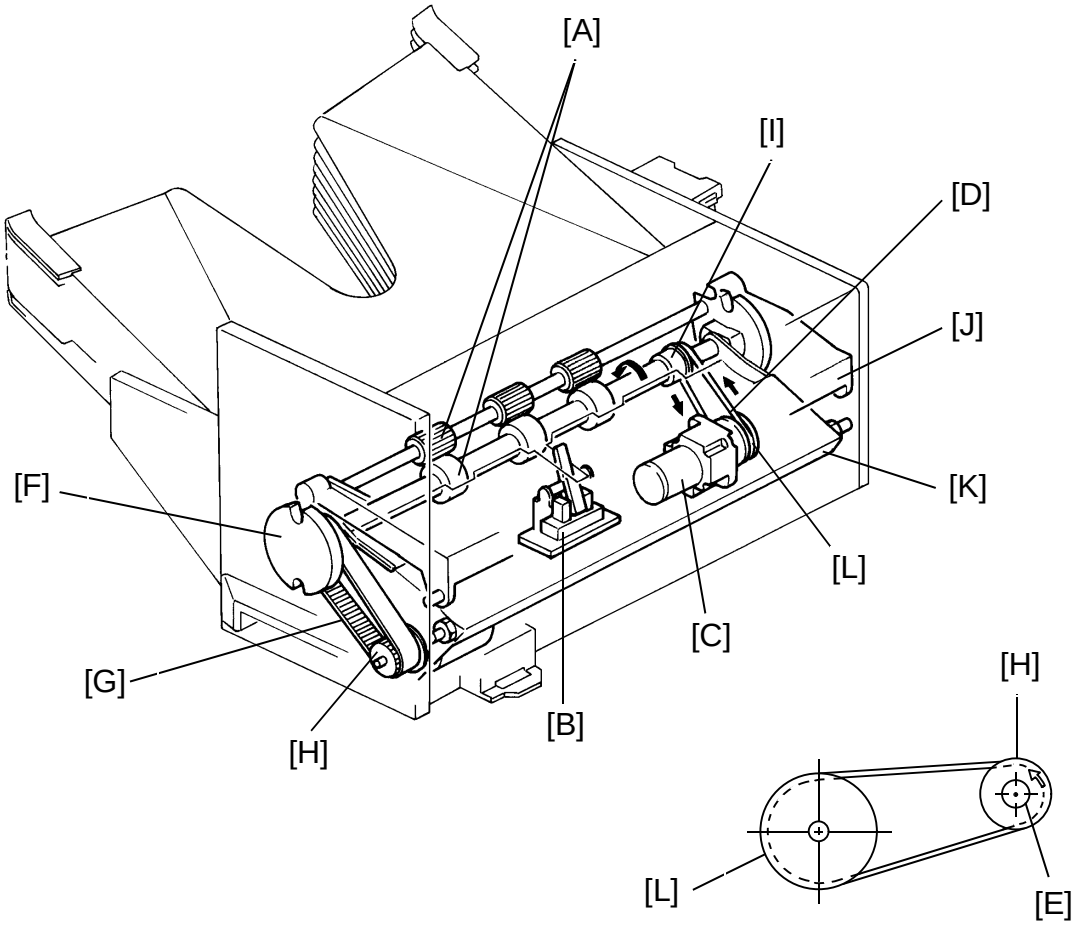
Pressing the Sorter key once shifts the copier to the sort mode. In this mode, all copies of the first original are delivered to separate bins starting from the top. The copies of the second original are delivered to the same bins, but starting from the bottom. The copies of the third original start from the top and so on. The bin drive motor turns on to advance the bin one step, 250 milliseconds after the copy has gone through the paper sensor. If the Copy Quantity, Clear/Stop, Book Copy, or Sorter key is pressed during the sort mode, all bins shift to the home position.

- Stack Mode -

Pressing the Sorter key twice shifts the copier to the stack mode. In this mode, all copies of the first original are delivered to the first bin, all copies of the second original are delivered to the second bin, and so on. The bin drive motor turns on to advance the bin one step, 250 milliseconds after the last copy of the original has gone through the paper sensor. If the Sorter key is pressed during stack mode, all bins shift to home position.

6. EXIT ROLLER DRIVE

6.1 ROLLER DRIVE MECHANISM

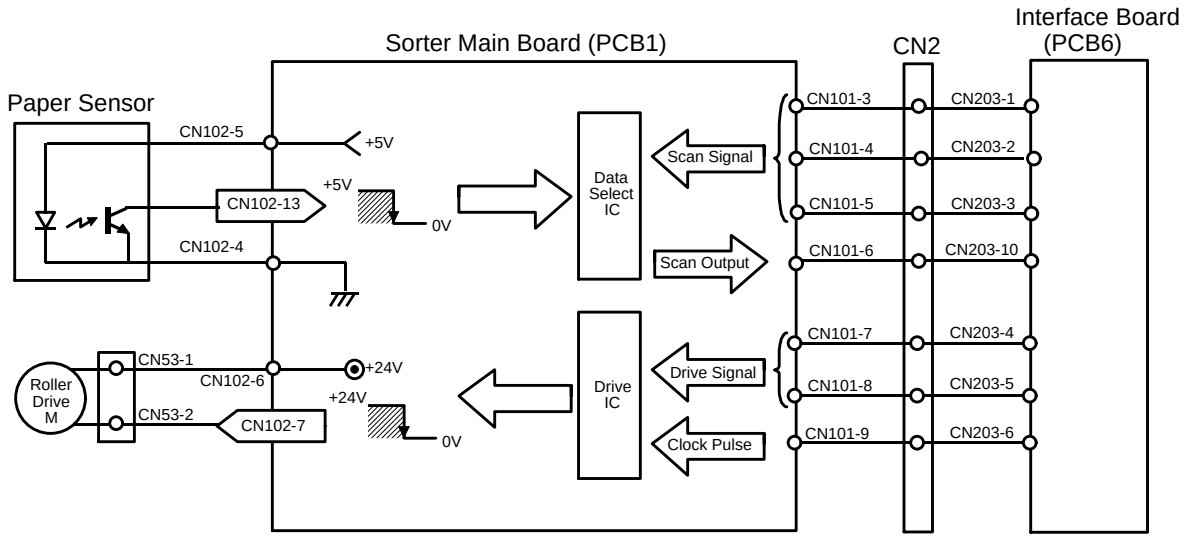


F: Transfer Wheel
G: Bin Drive Belt
H: Bin Drive Pulley
I: Exit Roller Pulley
J: Upper Paper Guide
K: Lower Paper Guide
L: Roller Drive Motor Pulley

The exit rollers [A] take over paper transport from the copier. When the copy paper actuates the copier exit sensor, the exit rollers start rotating. The exit rollers continue to rotate for 250 milliseconds after the copy paper has gone through the paper sensor [B].

The roller drive motor [C] rotates the lower exit roller via the roller drive belt [D]. The shaft of the lower exit roller is a cylindrical cavity type which rotates around the transfer wheel shaft [E]. The paper sensor is positioned just in front of the exit rollers. The paper sensor detects misfeeds in the sorter.

6.2 ROLLER DRIVE CIRCUIT

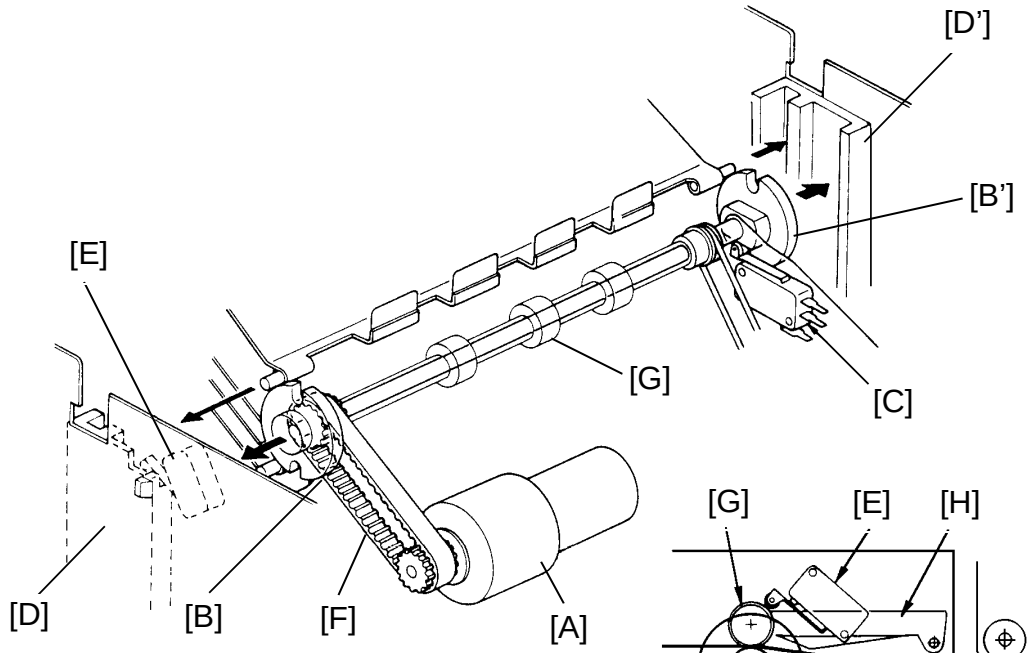


To turn on the roller drive motor, the interface board sends a drive signal to the drive IC on the sorter main board. After receiving the drive signal, the drive IC drops CN102-7 from +24 to 0 volt to turn on the roller drive motor.

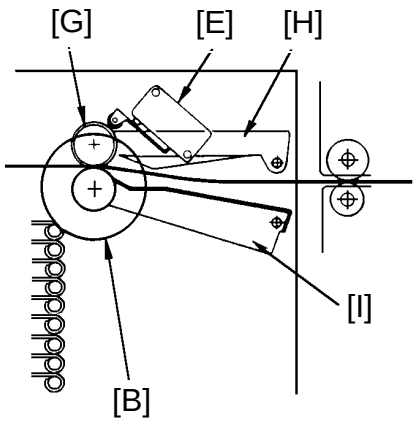
When the paper sensor is actuated, CN102-13 drops to LOW. The interface board outputs three scan signals to the data select IC. The status of the sensor changes the resulting scan output signal. Using the scan output signal, the copier main board determines the status of the sensor. For safety reasons, the CPU limits the operation time of the roller drive motor to 5 seconds.

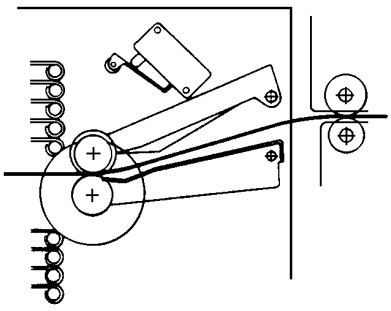
7. BIN DRIVE

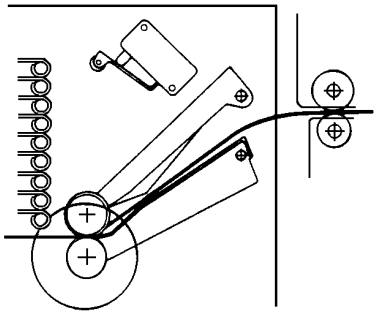
7.1 BIN DRIVE MECHANISM



G : Exit Roller
H : Upper Paper Guide
I : Lower Paper Guide







The bin drive mechanism moves the bins up and down to receive copies under the direction of the copier CPU. The main components in this mechanism are the bin drive motor [A], two transfer wheels [B,B'], the wheel switch [C], and the bins themselves.

Pins on either side of each bin are inserted into slots called bin guides [D,D']. The bins slide up and down in the bin guides. The bins sit on each other with the lower bin resting on the permanently-mounted 10th bin. The upper and lower paper guides pivot up and down depending on the height of the bin to be picked up or released.

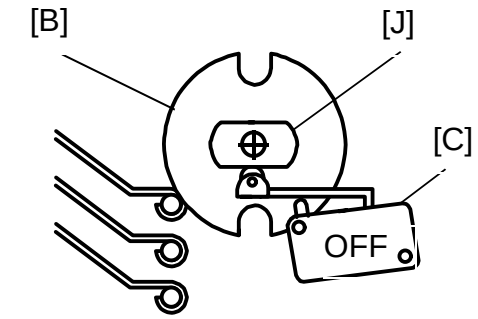
The home position switch [E] informs the CPU when all the bins are lowered.

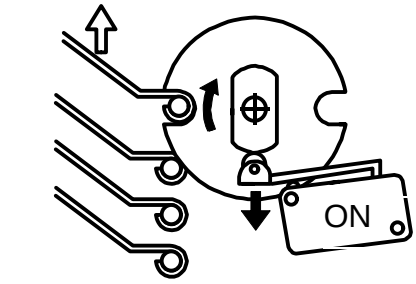
To move the bins up, the bin drive motor turns clockwise (as viewed from the front). A timing belt [F] turns the transfer wheels.

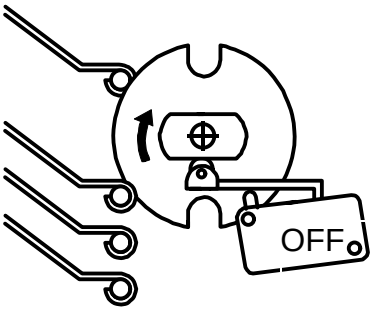
The transfer wheels have two slots in them 180 degrees apart. As the transfer wheels turn, these slots engage the bins and lift them up. Each time the transfer wheels turn 180 degrees, they raise one bin.

To move the bins down, the CPU reverses the bin drive motor and the above processes reverses.

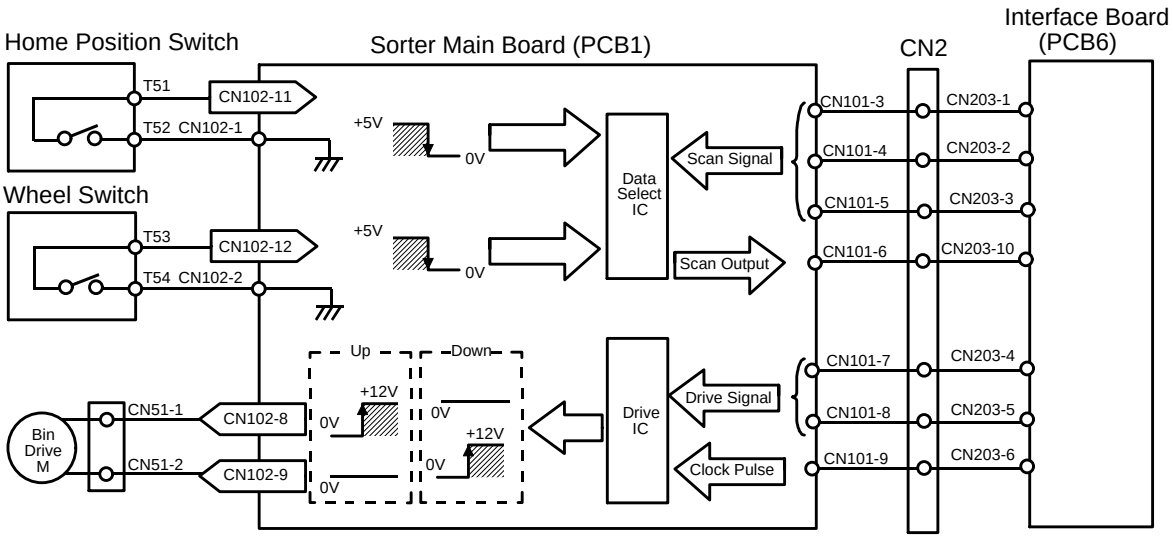
The CPU monitors the position of the bins through pulses generated by the wheel switch and the actuator cam [J]. The actuator cam has two flat sides that are 180 degrees apart and is mounted behind the rear transfer wheel. A pulse is generated each time one of the lobes of the actuator cam passes the wheel switch.







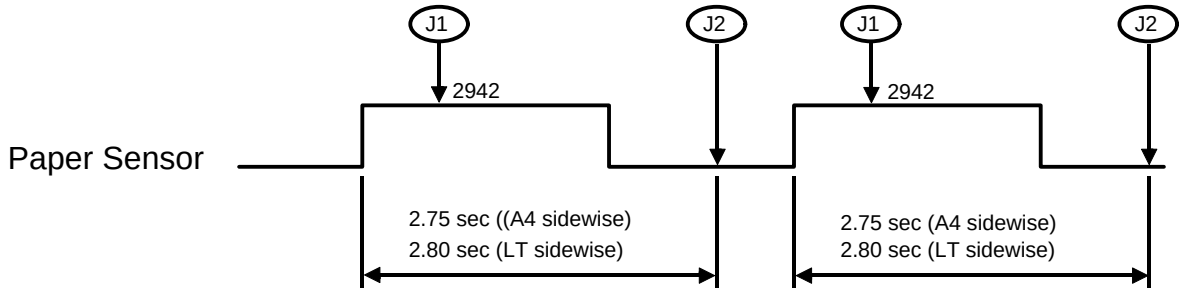
7.2 BIN DRIVE CIRCUIT



To turn on the bin drive motor, the interface board sends drive signals to the drive IC on the sorter main board. After receiving the drive signals, the drive IC either raises CN102-8 or CN102-9 to +12 volts. This turns on the bin drive motor which respectively moves a bin up or down. The main board monitors the output of both sorter switches through the data select IC through the interface board. When either the home position switch or wheel switch is actuated, CN102-11 or CN102-12 drops to LOW. The interface board outputs three scan signals to the data select IC. The status of the switches changes the resulting scan output signal. Using the scan output signal, the copier main board determines the status of the switch.

The CPU monitors the on-time of the bin drive motor to detect a malfunction of the bin drive motor. If the bin drive motor continues to rotate more than twelve seconds, the CPU stops machine operation.

8. MISFEED DETECTION



In addition to being used for the exit roller and bin drive timing, the paper sensor checks for a misfeed in the sorter. The copier CPU checks whether the paper sensor is actuated within 942 pulses (3.8 seconds) after the registration clutch turns on (at 2,000 pulses). (J1: Paper Sensor ON Check)

Also, the copier CPU starts a timing cycle when the paper sensor is actuated. Then, at 2.75 (A4 sidewise) or 2.80 (Letter sidewise) seconds, the CPU checks whether the copy paper has passed through the paper sensor. (J2: Paper Sensor OFF Check)

In misfeed condition, the "Check Paper Path" and "Misfeed Location" indicators lights and copier operation is inhibited. To recover the sorter from the misfeed condition, the sorter has to be slide away from the copier, then, after misfed paper removal, returned to its original position.

9. INSTALLATION PROCEDURE

9.1 ACCESSORY CHECK

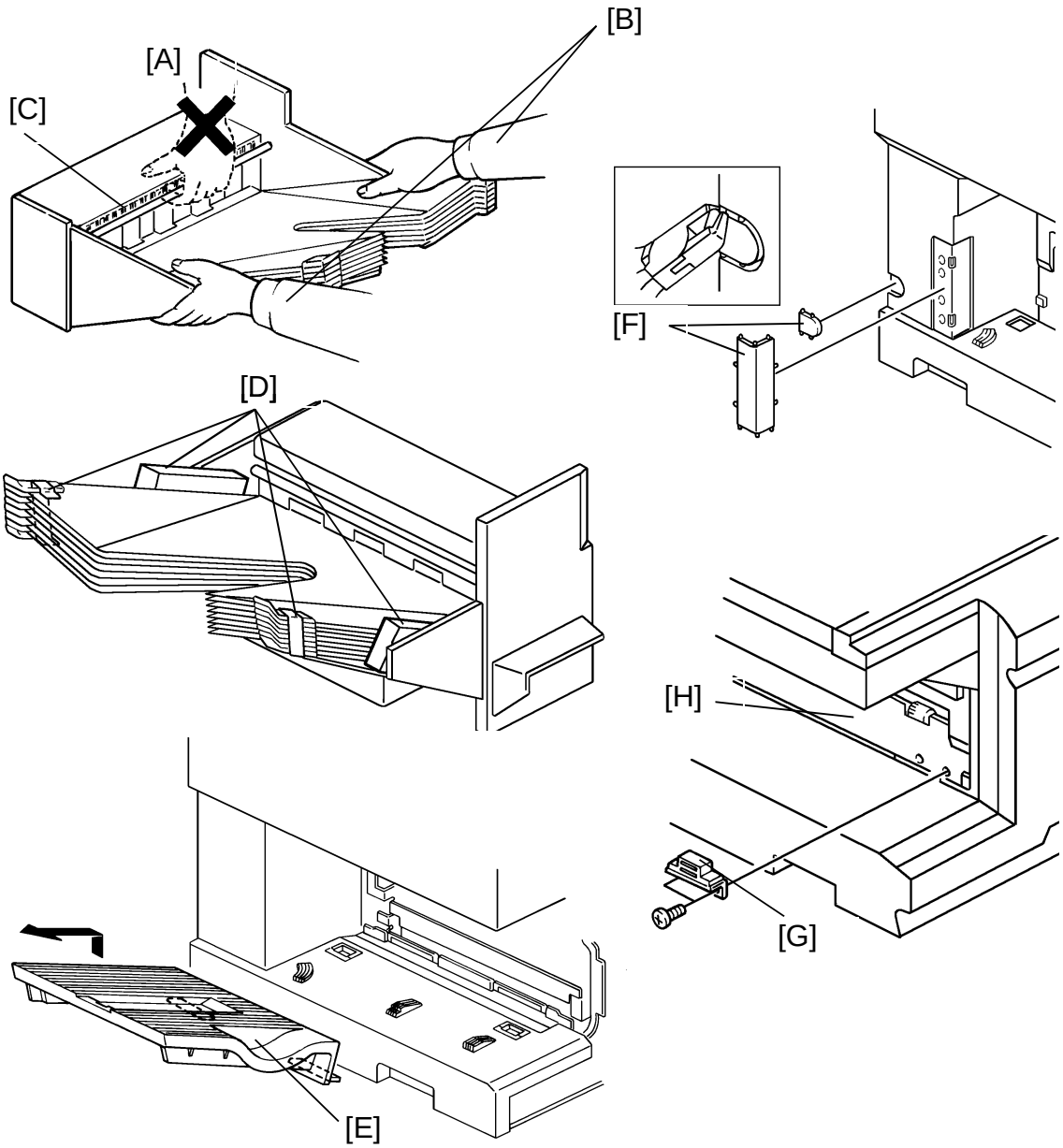
Check the quantity and condition of the accessories in the box according to the following list:

1. Magnet Catch 1
2. Sorter Holder Bracket 1
3. Sorter Holder Bracket Cover 1
4. Philips Pan Head Screw - M4 x 8 8
5. Philips Pan Head Screw - M4 x 8 1
6. Screw M4 x 8 1
7. Snap Ring 1

NOTE: 1. If the sorter is installed on the copier, the DC Power Supply Unit (option) is required.

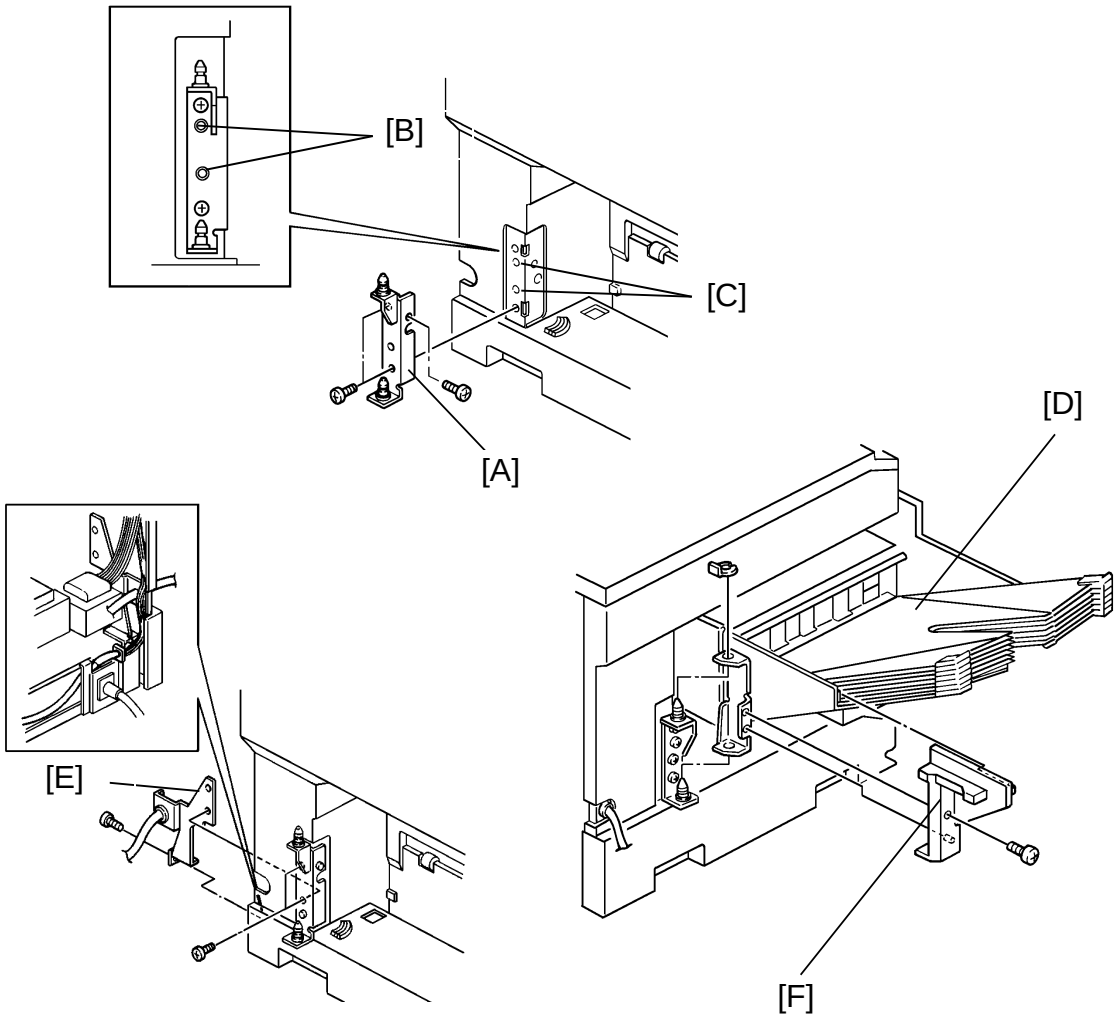
2. When installing the optional DC Power Supply Unit, please refer to the installation procedure enclosed with it.

9.2 INSTALLATION PROCEDURE

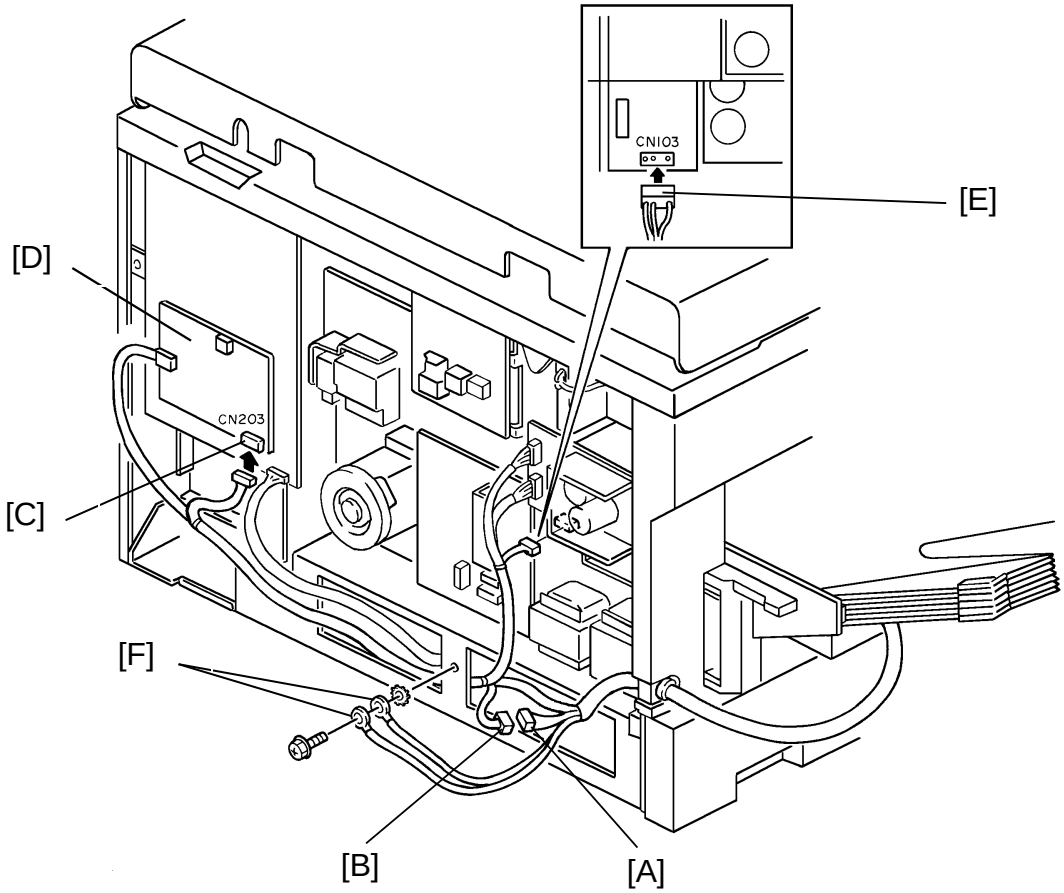


NOTE: Do not grasp the sorter by the top cover and stay as shown by [A]. Hold both sides of the sorter as shown by [B]. This is to prevent anti-static brush [C] damage.

1. Turn off the main switch and unplug the power supply cord of the copier.
2. Remove the strips and styrofoam blocks [D].
3. Remove the receiving tray [E].
4. Remove the caps [F] on the upper left side cover with the pliers.
5. Install the magnet catch [G] on the exit unit [H] (2 screws).

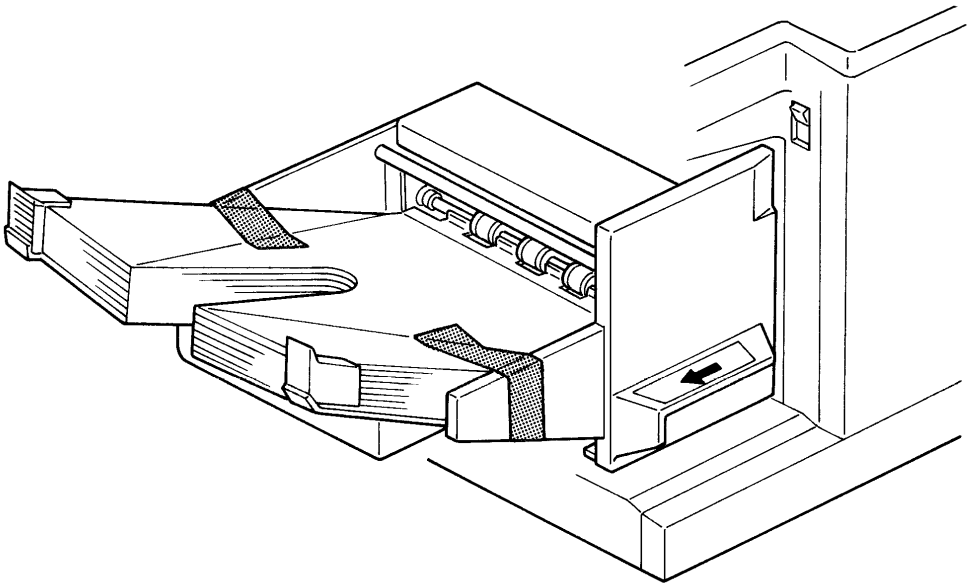


6. Install the sorter holder bracket [A] (3 screws) so that the two holes [B] on the bracket align with the holes [C] on the copier frame as shown.
7. Install the optional DC Power Supply Unit. (See the installation procedure enclosed with the unit.)
8. Install the sorter [D] on the sorter holder bracket (1 snap ring) as shown.
9. Install the sorter harness bracket [E] with the harness (1 screw).
10. Secure the sorter holder bracket and sorter harness bracket (2 screws).
11. Install the sorter holder bracket cover [F] (1 screw).



12. Connect the sorter dc harness [A] (10P/Brown) to the optional harness connector [B]; then, connect the optional harness connector [C] to CN203 on the interface board [D].
13. Connect the dc harness [E] (3P/White) to CN103 on the main dc power supply unit.
14. Secure the grounding wire [F] (1 screw and toothed washer) on the bottom plate as shown.
15. Plug in the copier power supply cord.
16. Turn on DIP switch 101-4 on the main board and turn on the main switch. Then, change the SP Mode #71 data to "1" (sorter instruction).
17. Turn off the main switch and DIP switch 101-4.
18. Replace all covers and turn on the main switch.
19. Check the operation of the sorter.

10. PREPARATION FOR TRANSPORTATION

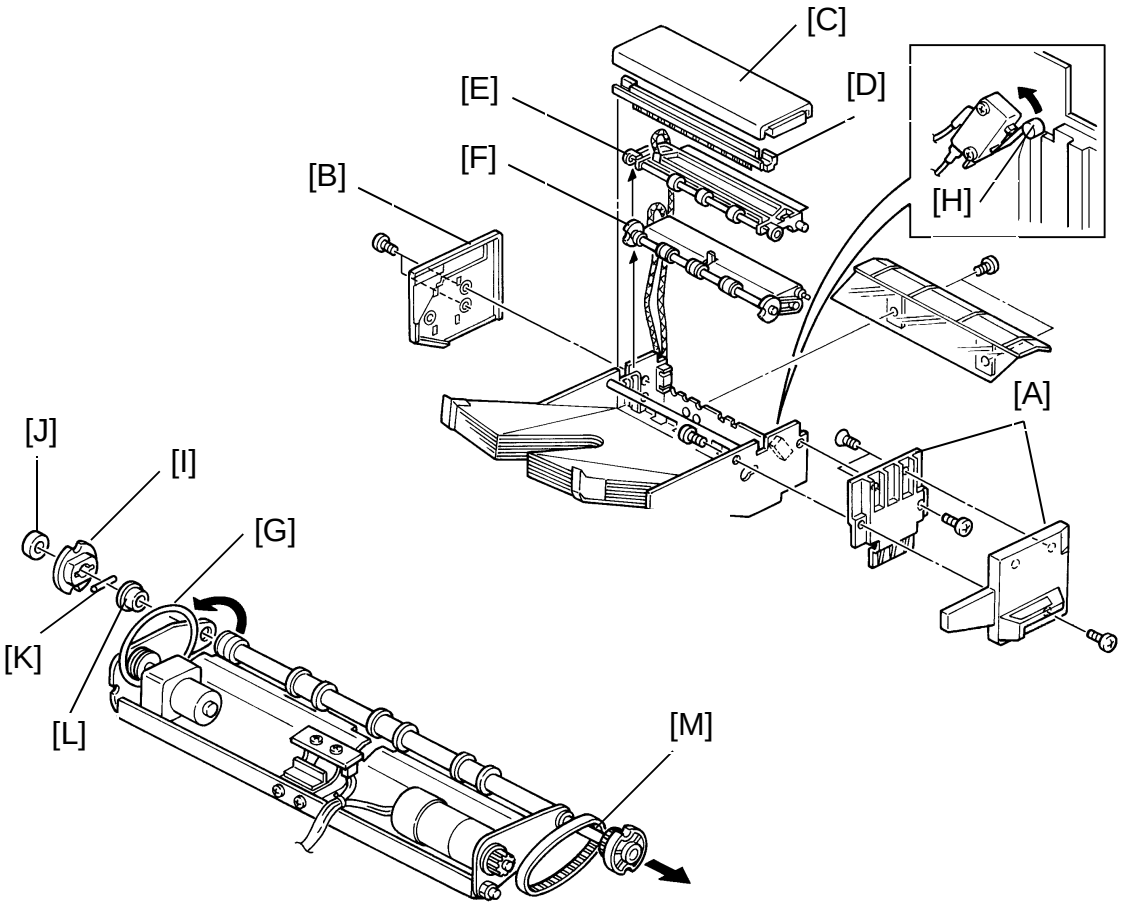


CAUTION: When removing and transporting the sorter, be careful not to carry it in a vertical position as the bins will become dislocated.

CAUTION: Before moving the sorter, be sure to prepare it for transportation as follows. The sorter may be badly damaged if it is moved without proper preparation.

1. If the bins are not at the home position, turn on the main switch of the copier to move the bins to the home position.
2. Secure the bins with strips of tape as shown in the illustration.
3. Remove the sorter from the copier. (See the Installation Procedure [Sorter] section.)

11. ROLLER DRIVE BELT REPLACEMENT



1. Remove the front covers [A] (5 screws) and rear cover [B] (2 screws).
2. Lift off the top cover [C].
3. Remove the top stay [D].

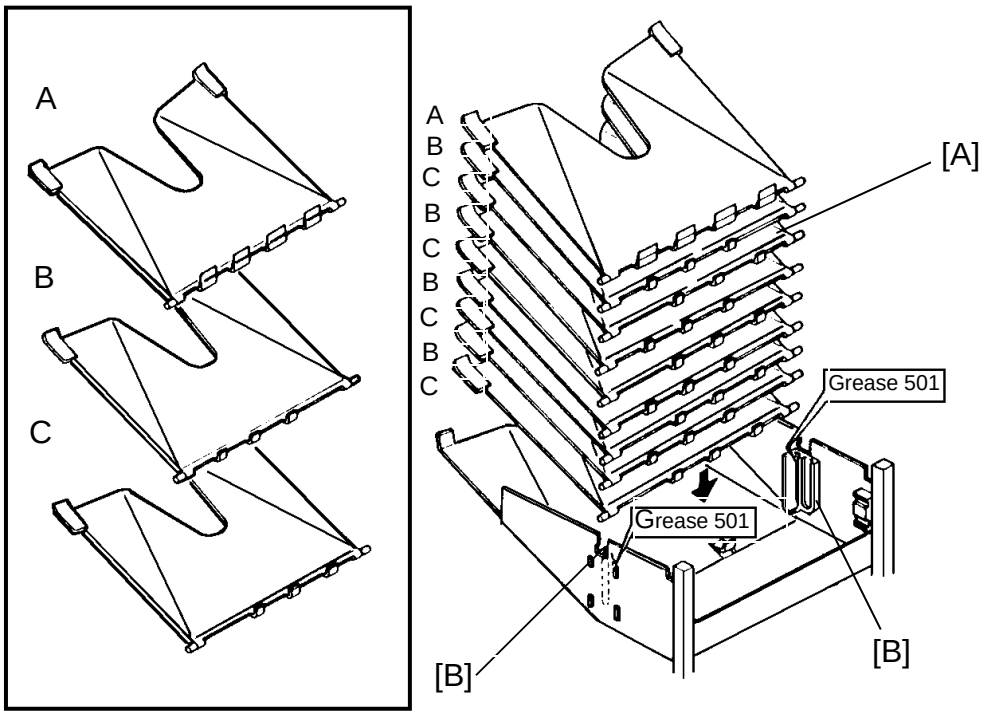
NOTE: Be sure that the discharge brush on the top stay is facing the exit side of the sorter when reinstalling it.

4. Lift the upper paper guide [E] up and out of position.
5. Lift the lower paper guide [F] out of position and turn it over to remove the roller drive belt [G].

NOTE: Be careful not to damage the sorter home position switch actuator [H] when reassembling.

6. Remove transfer wheel [I], spacer [J], pin [K] and bushing [L] (1 C-ring).
7. Slide the wheel shaft [M] towards the front and remove the roller drive belt.

12. BIN GUIDE LUBRICATION



1. Remove the lower paper guide. (See Roller Drive Belt Replacement section.)
2. Remove all bins [A] from the bin guides [B].
3. Apply Grease 501 to the grooves of the bin guides.

NOTE: There are three kinds of bins. Therefore, when installing the bins, be sure that they are installed in the correct order.

SECTION 10
DUPLEX

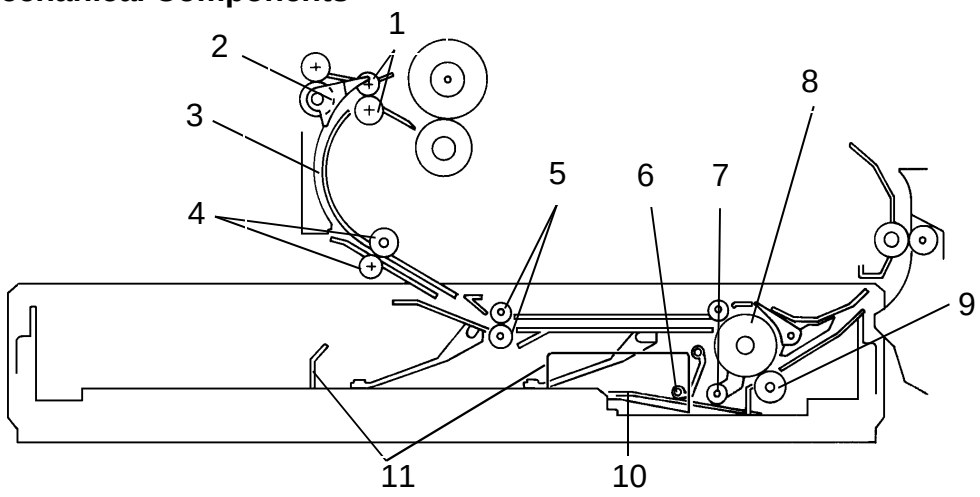
1. SPECIFICATIONS

Copy Paper Size:	A4 and B5/8 1/2" x 11" (sideways)
Paper Weight:	59 to 104 g/m2 (16 to 27 lb)
Paper Stack:	50 sheets
Dimension (W x D x H):	516 x 529 x 90 mm (20.4" x 20.9" x 3.6")
Weight:	Approximately 5 kg (11 lb)

- Specifications are subject to change without notice.

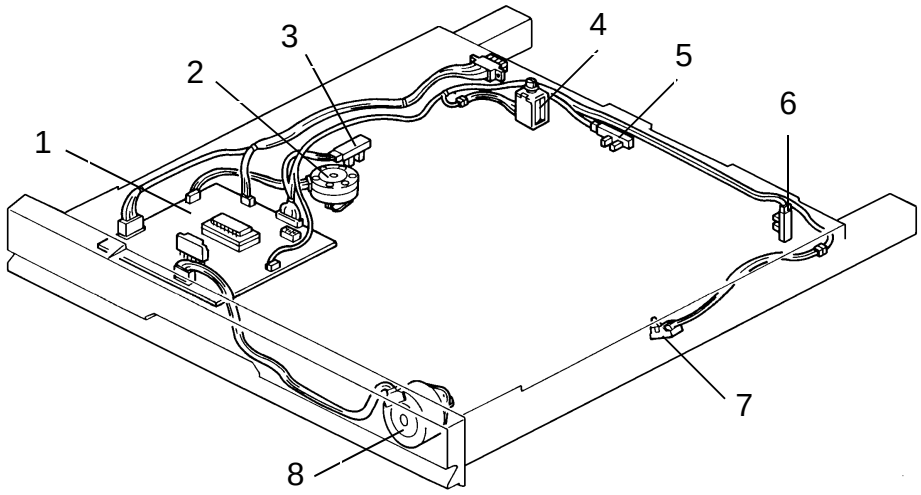
2. COMPONENT LAYOUT

— Mechanical Components —



1. Duplex Gate Roller
2. Duplex Gate
3. Turn Guide Plate
4. Transport Roller
5. Entrance Roller
6. Paper End Feeler
7. Paper Flattener
8. Duplex Feed Roller
9. Friction Roller
10. Duplex Bottom Plate
11. Jogger Fences

— Electrical Components —

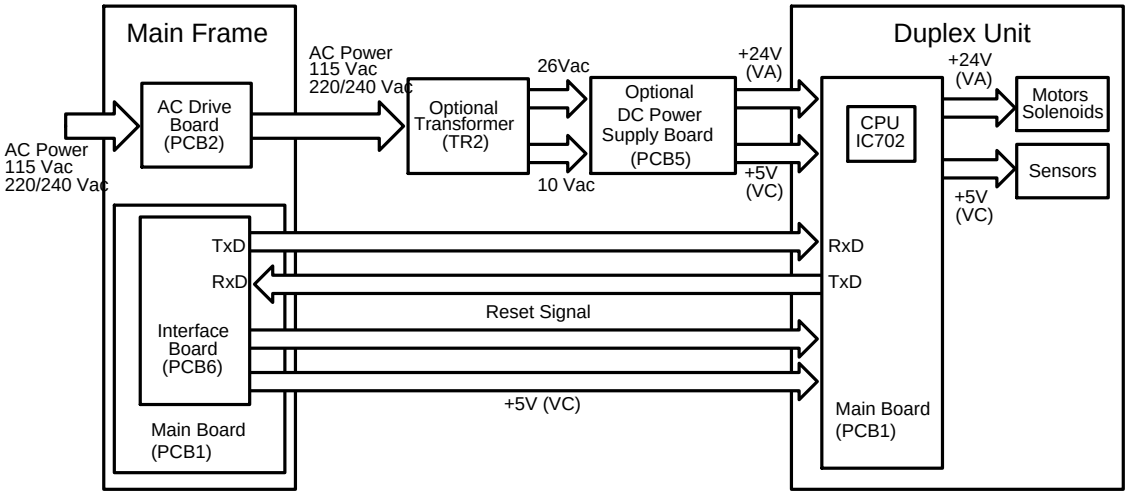


1. Main Board
2. Jogger Motor
3. Jogger HP Sensor
4. Duplex Gate Solenoid
5. Duplex Entrance Sensor
6. Duplex Paper End Sensor
7. Duplex Turn Sensor
8. Duplex Feed Motor

3. ELECTRICAL COMPONENT DESCRIPTION

SYMBOL	NAME	FUNCTION	INDEX NO.
Motors			
M1	Duplex Feed Motor	Stepper motor (24 Vdc) drives feed roller and moves the bottom plate up and down.	8
M2	Jogger Motor	Stepper motor (24 Vdc) drives the jogger fences to square the paper stack on the duplex tray.	2
Solenoids			
SOL 1	Duplex Gate Solenoid	Moves the duplex gate to direct copies to the duplex tray or to the paper exit.	4
Sensors			
S1	Duplex Entrance Sensor	Detects copy at the entrance.	5
S2	Duplex Turn Sensor	Detects copy in the turn section.	7
S3	Duplex Paper End Sensor	Detects copy in the duplex tray.	6
S4	Jogger Home Position Sensor	Detects whether the jogger fences are at home position.	3
Printed Circuit Board			
PCB1	Duplex Main Board	Controls all duplex unit functions.	1

4. POWER DISTRIBUTION AND OVERALL MACHINE CONTROL

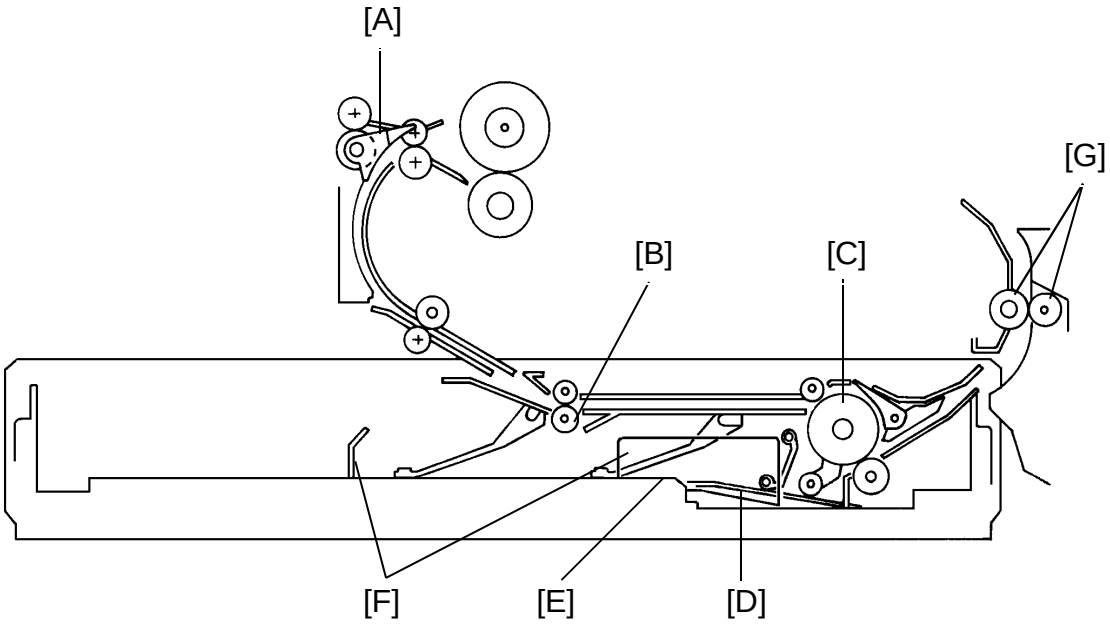


When the main switch is turned on, the optional transformer receives wall outlet ac power through the ac drive board and outputs 10 volts ac and 26 volts ac to the optional dc power supply board. The optional dc power supply board then converts the 10 volts ac input to +5 volts and the 26 volts ac input to +24 volts. Then, the +5 volts and +24 volts are supplied to the duplex unit main board. The interface board also provides +5 volts to the duplex unit main board and sends a reset signal to initialize the duplex unit CPU.

The duplex unit main board supplies dc power to all electrical components in the duplex unit. All motors and solenoid operate on +24 volts and all sensors operate on +5 volts.

The duplex unit has its own CPU which controls all functions in the duplex unit. The duplex unit CPU communicates with the copier through the interface board using a serial interface.

5. BASIC OPERATION



5.1 FIRST SIDE COPY

When the registration clutch turns on, the duplex gate [A] rotates up to direct the copy to the duplex unit. The entrance roller [B] and duplex feed roller [C] then start to rotate. At the same time, the duplex bottom plate [D] lowers.

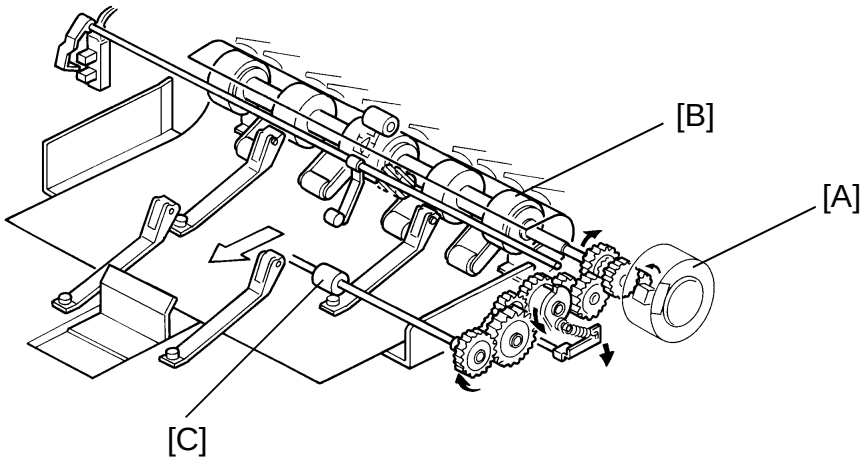
5.2 DUPLEX STACKING

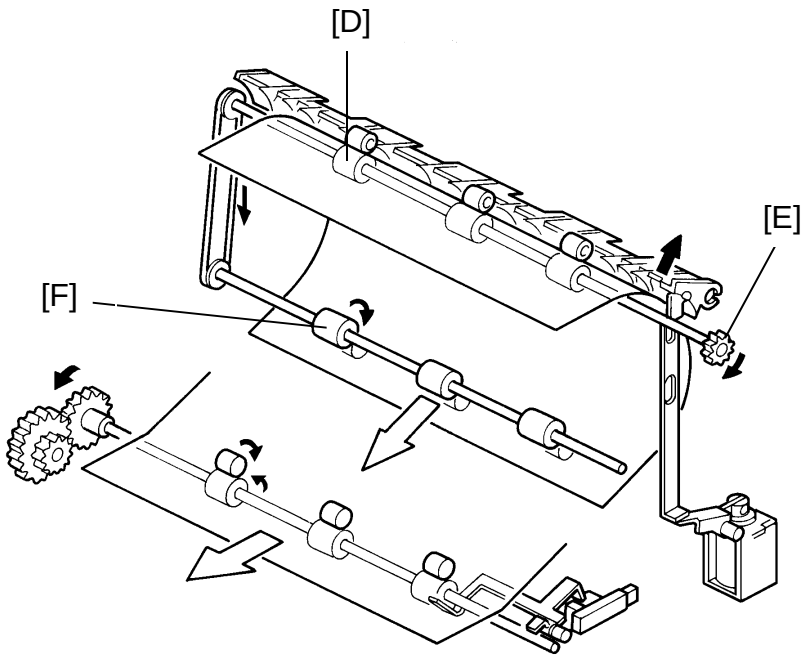
After the copy is delivered to the duplex tray [E], the jogger fences [F] move inward to square the copy stack, then move back 10 mm. After the final copy is delivered to the tray, the jogger fences remain against the paper stack.

5.3 SECOND SIDE COPY

Soon after the final copy is squared by the jogger fences, the duplex bottom plate raises up to the final position and the duplex feed rollers start rotating counterclockwise (front view) to feed the copy to the relay rollers [G]. Second side copying is then done with the copy following the second feed station paper path.

6. DRIVE MECHANISM



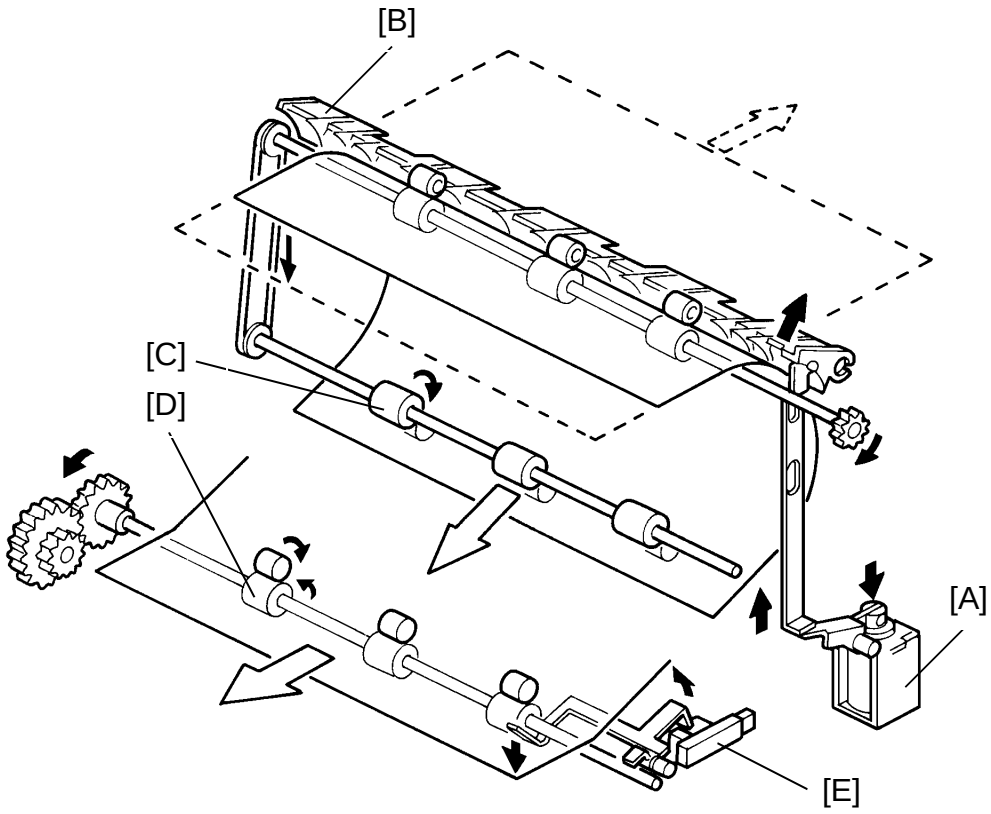


Drive is transmitted from the duplex feed motor [A] to the duplex feed rollers [B] and the entrance rollers [C] through a series of gears. A relay gear in the copier exit section transmits drive to the duplex gate rollers [D] through the duplex transport gear [E]. A rubber belt on the end of the duplex gate roller shaft drives the transport rollers [F].

The duplex feed motor also drives the duplex bottom plate up and down.

7. FIRST SIDE COPY

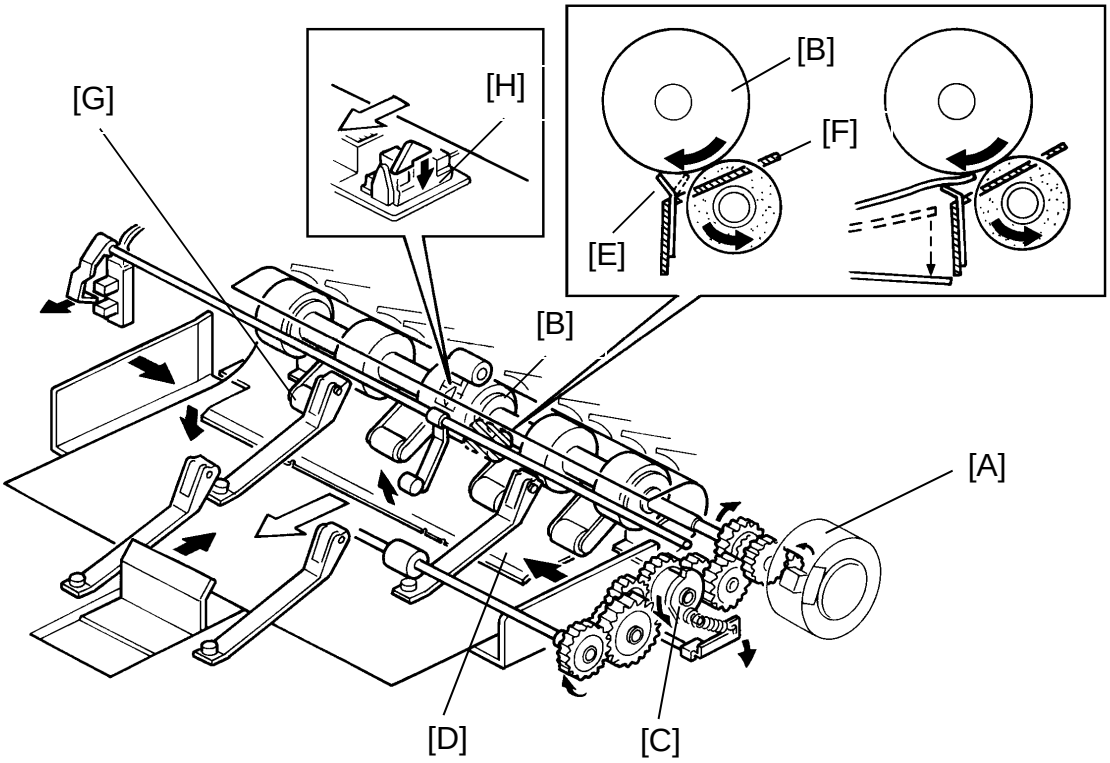
7.1 FROM COPIER PAPER FEED SECTION TO DUPLEX ENTRANCE ROLLER



When the copier 1st paper feed clutch turns on, the jogger motor turns on and drives the three jogger fences into position 10 mm from the edges of the copy paper. (This position is determined by cassette coding.) The registration clutch then turns on and the duplex gate solenoid [A] energizes to raise the duplex gate [B]. The duplex gate solenoid stays on until first side copying is finished.

The copy is then directed to the duplex turn guide, where it is fed by the transport rollers [C] to the entrance rollers [D]. The leading edge of the copy activates the duplex entrance sensor [E], which is monitored by the duplex CPU to detect misfeeds.

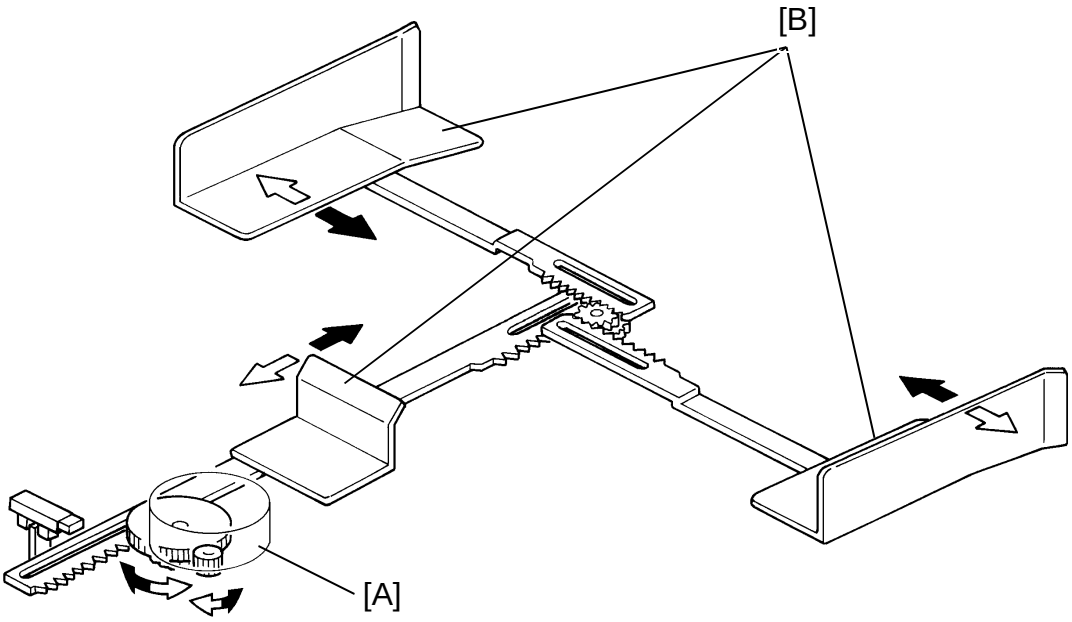
7.2 FROM DUPLEX ENTRANCE ROLLER TO DUPLEX TRAY



300 milliseconds after the duplex gate solenoid energizes, the duplex paper feed motor [A] starts turning counterclockwise (front view). Gears drive the duplex feed rollers [B] clockwise and the cam clutch [C] counterclockwise (front view). The cam clutch rotation lowers the duplex bottom plate [D].

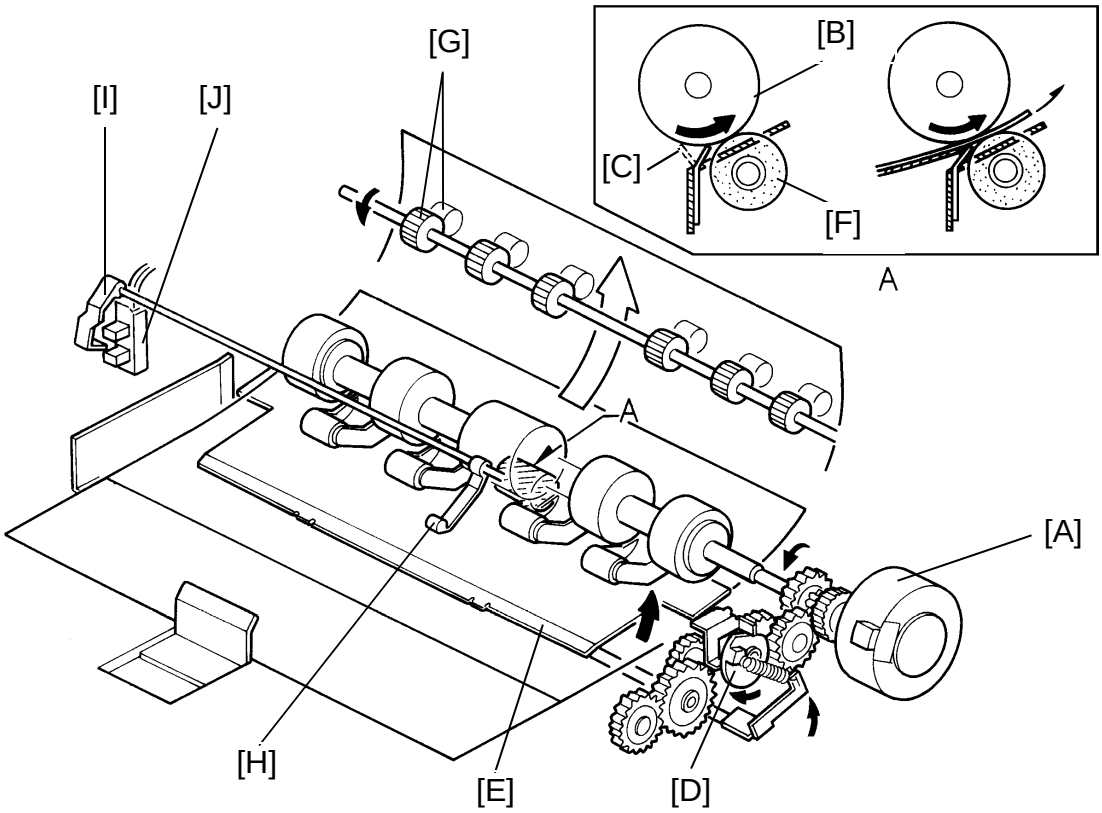
The tip of the flip mylar [E] moves to the left (front view) when the duplex feed rollers rotate to feed the copy into the duplex tray. The mylar presses the copy against the rollers, ensuring that the trailing edge of the copy clears the guide plate [F]. The paper flatteners [G] correct curl on the leading edge of the copies. The leading edge of the copy actuates the duplex turn sensor [H], which is monitored by the duplex CPU to detect misfeeds.

7.3 DUPLEX STACKING



2,150 milliseconds after the duplex turn sensor is actuated by the leading edge of the copy, the jogger motor [A] rotates to drive the jogger fences [B] inward to square the paper stack, then the fences move back 10 mm. After the last copy of the first side copying run enters the duplex tray, the fences remain against the stack.

8. SECOND SIDE COPY

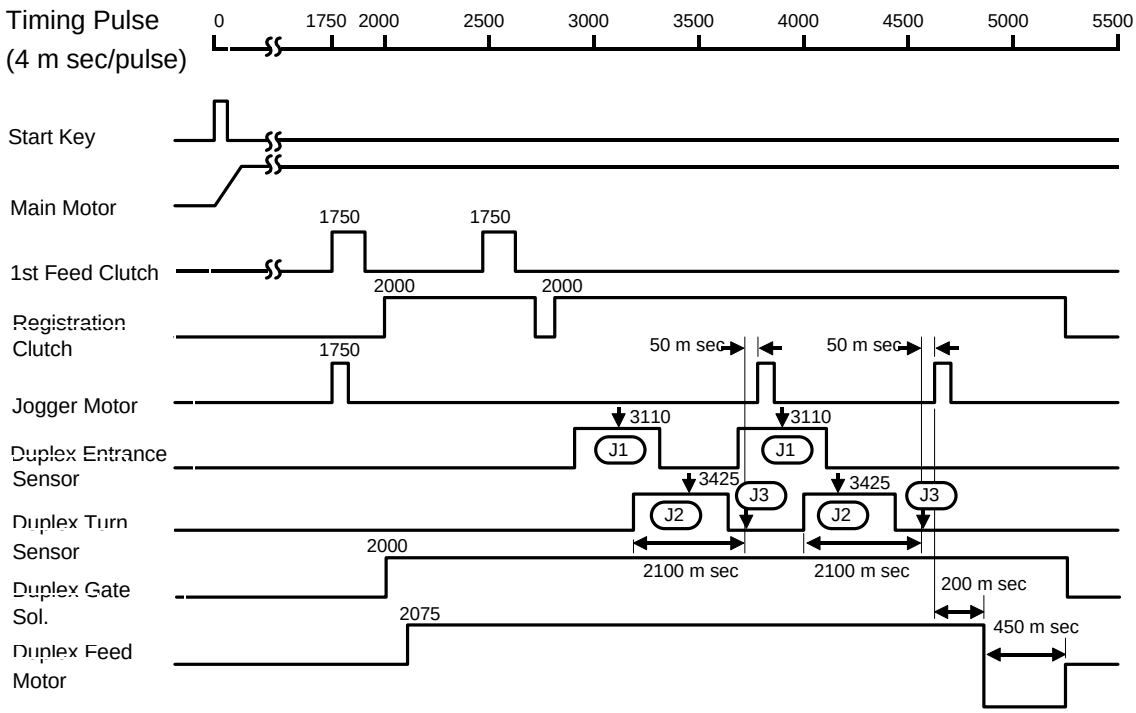


2,350 milliseconds after the duplex turn sensor is actuated by the leading edge of the final copy in the first side copy run, the duplex feed motor [A] reverses direction and rotates clockwise (front view), rotating the duplex feed roller [B] counterclockwise (front view). This moves the flip mylar [C] back to the right (front view). At the same time the cam clutch [D] rotates clockwise (front view), raising the duplex bottom plate [E].

The paper feed system, which consists of the duplex feed roller [B] and the friction roller [F], feeds only the top sheet of the stack copies to the relay rollers [G] in the copier. After that, the second side copies follow the second feed station paper path.

After the final copy leaves the duplex bottom plate, the paper end feeler [H] drops through a slot in the duplex bottom plate.The paper end actuator [I], which is on the same shaft as the paper end feeler, pivots into the duplex paper end sensor [J], sending a High signal to the main board to stop the next paper feeding cycle.

9. DUPLEX PAPER FEED AND MISFEED DETECTION TIMING



The duplex entrance sensor and the duplex turn sensor monitor the movement of the paper through the paper path in duplex mode. If the duplex CPU determines that a misfeed exists, the duplex CPU sends a misfeed signal to the copier CPU through the interface board, and the Check Paper Path and the Misfeed Location indicators turn on. When the main switch is turned on, the CPU checks these two sensors for initial misfeed. During the first side copy cycle, the duplex CPU performs three kinds of misfeed detection:

J1: Checks whether the duplex entrance sensor is actuated within 1,110 pulses (about 4.4 seconds) after the registration clutch turns on. (The Misfeed Location indicator "D" turns on.)

J2: Checks whether the duplex turn sensor is actuated within 1,315 pulses (about 5.3 seconds) after the registration clutch turns on. (The Misfeed Location indicator "E" turns on.)

J3: Checks whether the copy paper passes through the duplex entrance sensor 525 pulses (2.1 seconds) after the duplex turn sensor has been actuated. (The Misfeed Location indicator "E" turns on.)

In the second side copy cycle, the misfeed detection timing is same as the one in the second feed station copying.

10. SERVICE CALL CONDITION

Service Code 80: Duplex and Copier Main Board Communication Error

The copier main board does not receive any signal from the duplex main board.

Service Code 81: Interface Board Error

The interface board is not connected when the duplex unit is installed.

Service Code 82: Jogger Home Position Error

The output of the jogger home position sensor remains LOW as the duplex main board is driving the jogger fences outward.

Service Code 83: Jogger Home Position Error

The output of the jogger home position sensor remains HIGH as the duplex main board is driving the jogger fences inward.

11. DUPLEX UNIT INSTALLATION

11.1 ACCESSORY CHECK

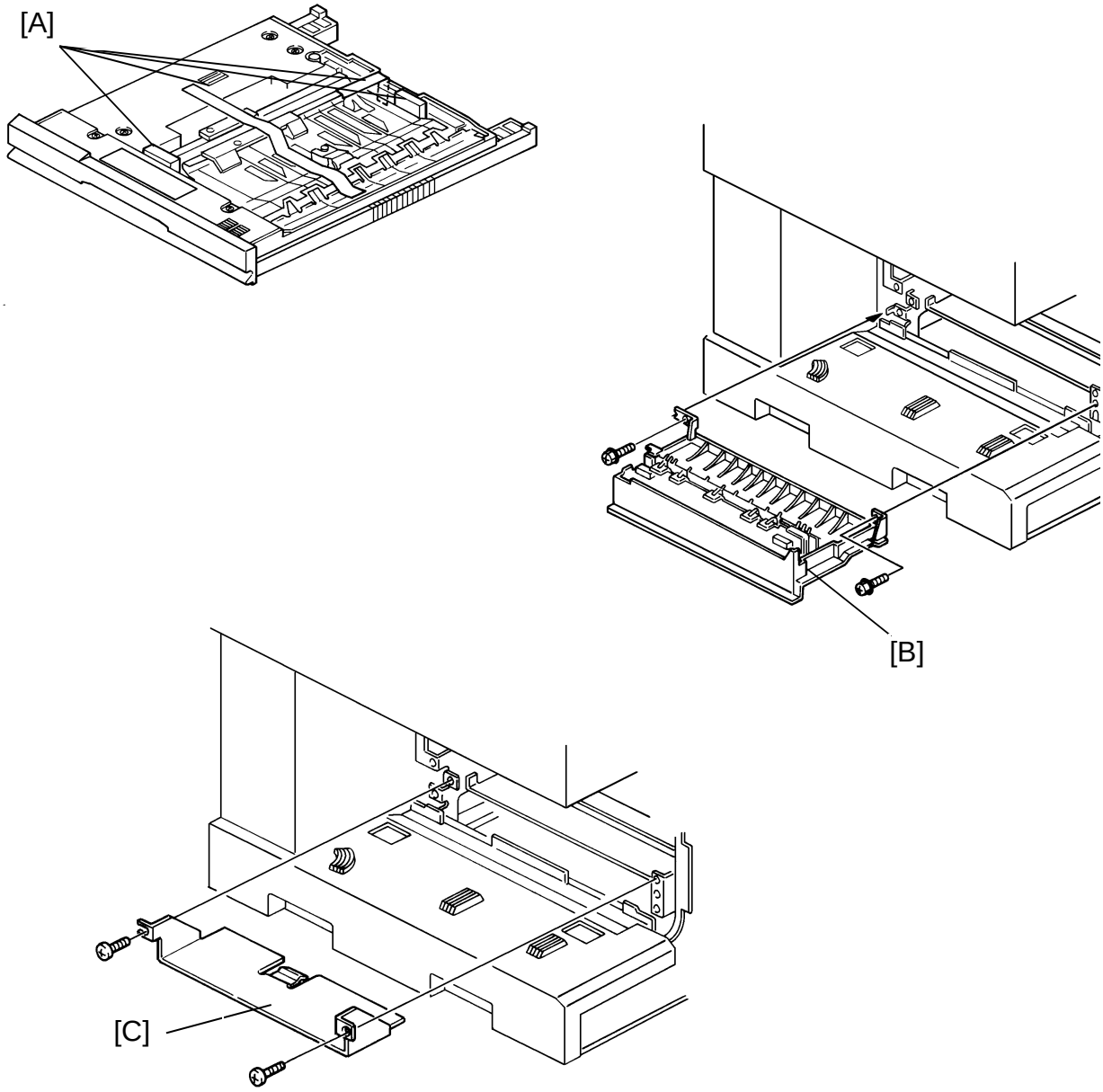
Check the quantity and condition of the accessories in the box according to the following list:

1. Turn Guide Plate 1
2. Roller 3
3. Connector Bracket 1
4. Shoulder Screw 2
5. Philips Pan Head Screw - M3 x 6 4
6. Tray Cover 1

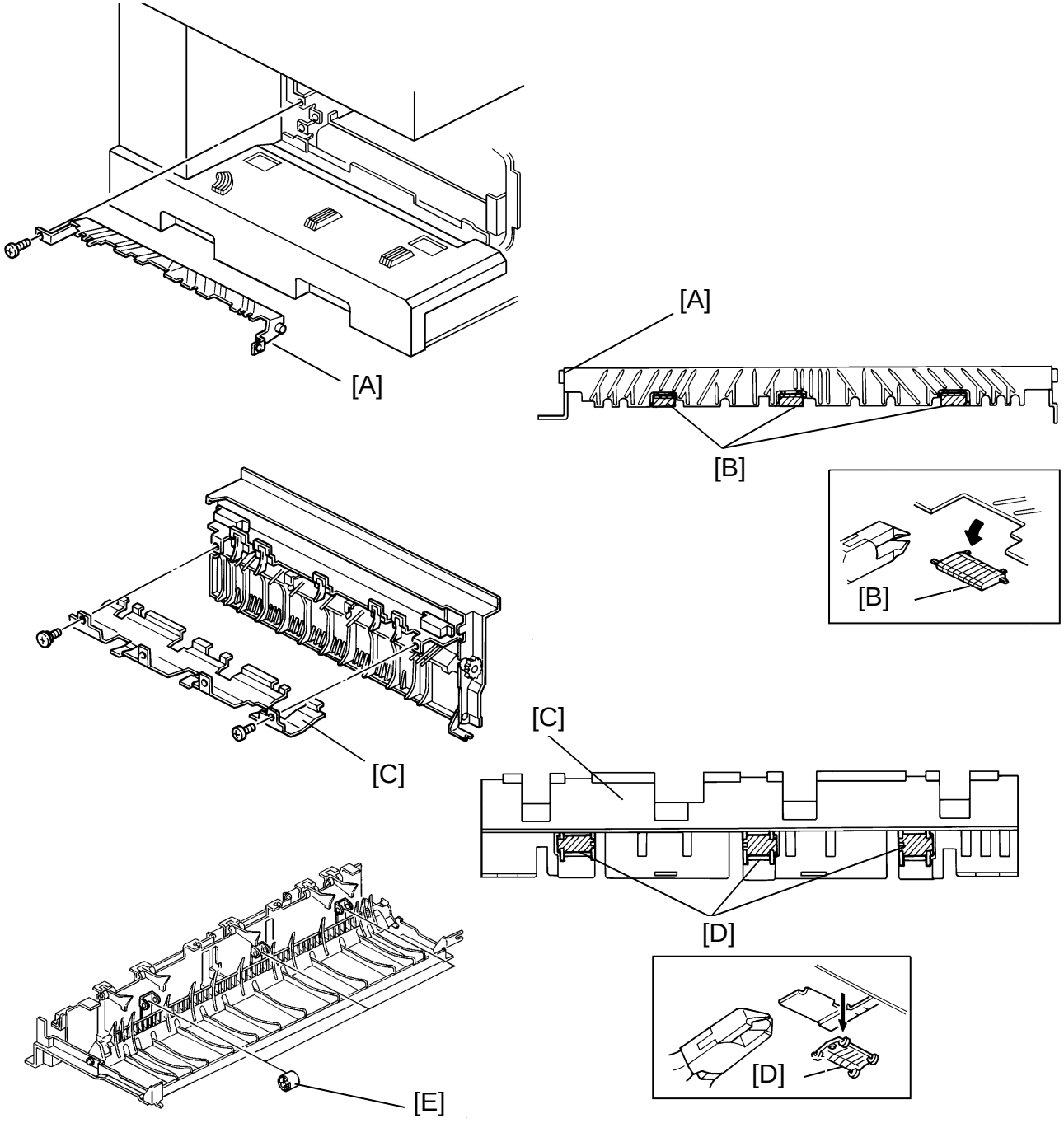
NOTE: 1. When the duplex unit is installed on the copier, the DC Power Supply Unit (option) is required.

2. When installing the DC Power Supply Unit, please refer to the installation procedure enclosed with it.

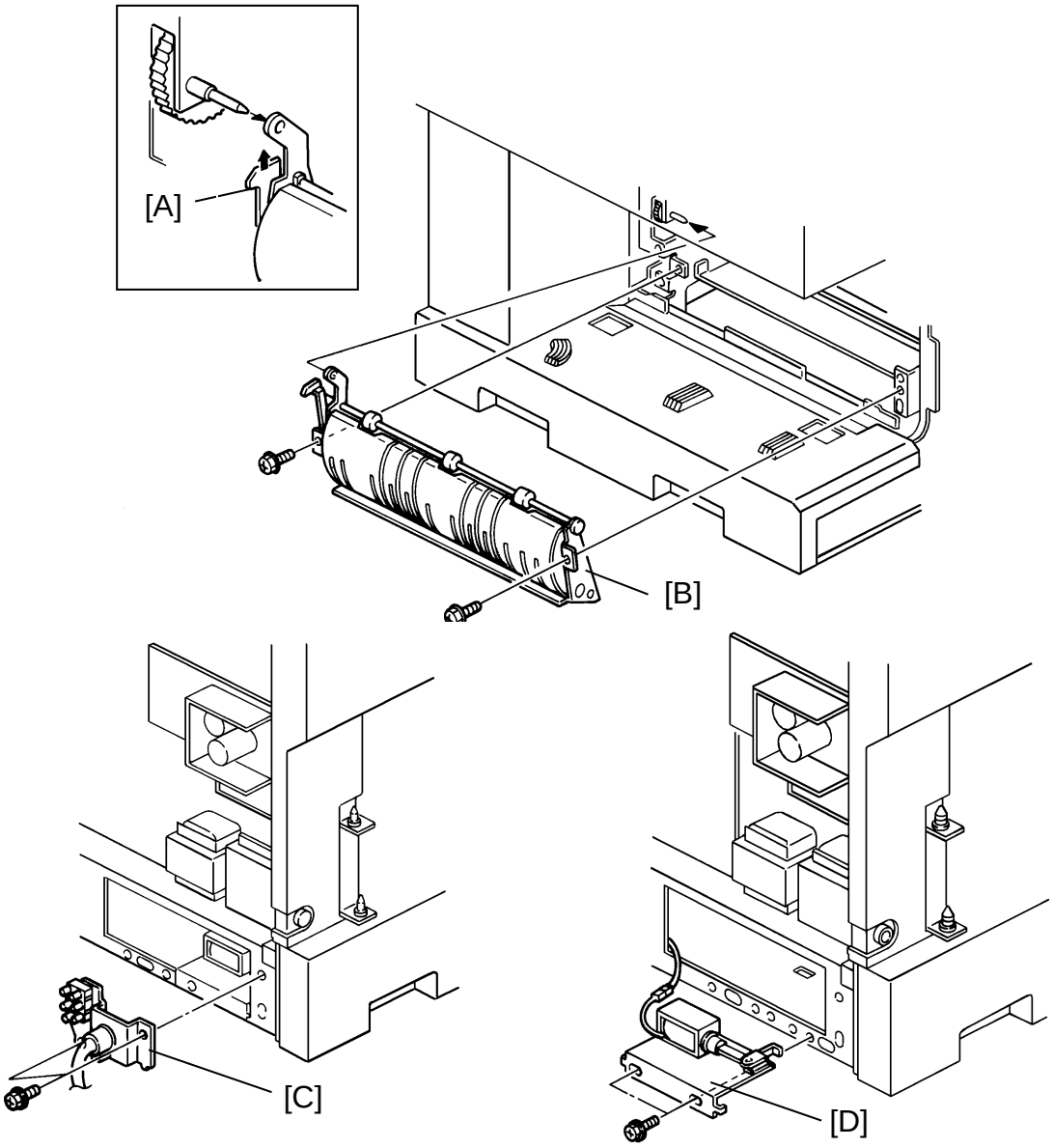
11.2 INSTALLATION PROCEDURE



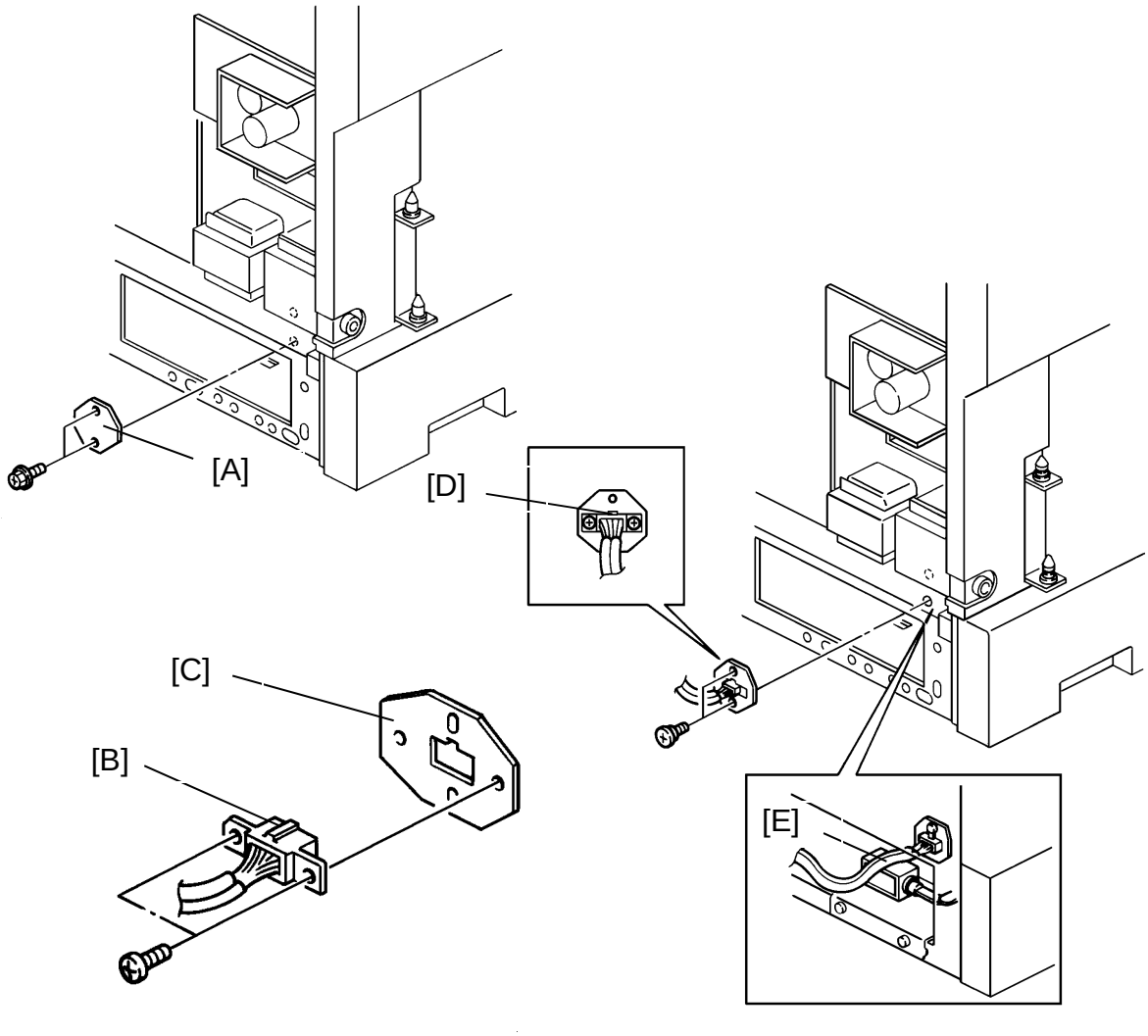
1. Turn off the main switch and unplug the copier power supply cord.
2. Install the dc power supply unit.
3. Remove the strips and styrofoam blocks [A].
4. Open the exit unit [B] and remove it (2 screws).
5. Remove the fusing bottom plate [C].



6. Remove the exit paper guide [A] (1 screw), and remove the stubs [B] with nippers and reinstall the exit paper guide.
7. Remove the upper paper guide [C] on the exit unit (2 screws) and remove the stubs [D] with nippers.
8. Install the three rollers [E] on the exit unit as shown.
9. Reinstall the upper paper guide plate [C] on the exit unit.



10. While pushing up the duplex gate lever [A], install the turn guide plate [B] (2 screws).
11. Reinstall the exit unit (2 screws).
12. Remove the paper tray from the copier if it is installed.
13. Remove the power supply cord bracket [C] (2 screws).
14. Remove the tray lock solenoid bracket [D] (1 screw).

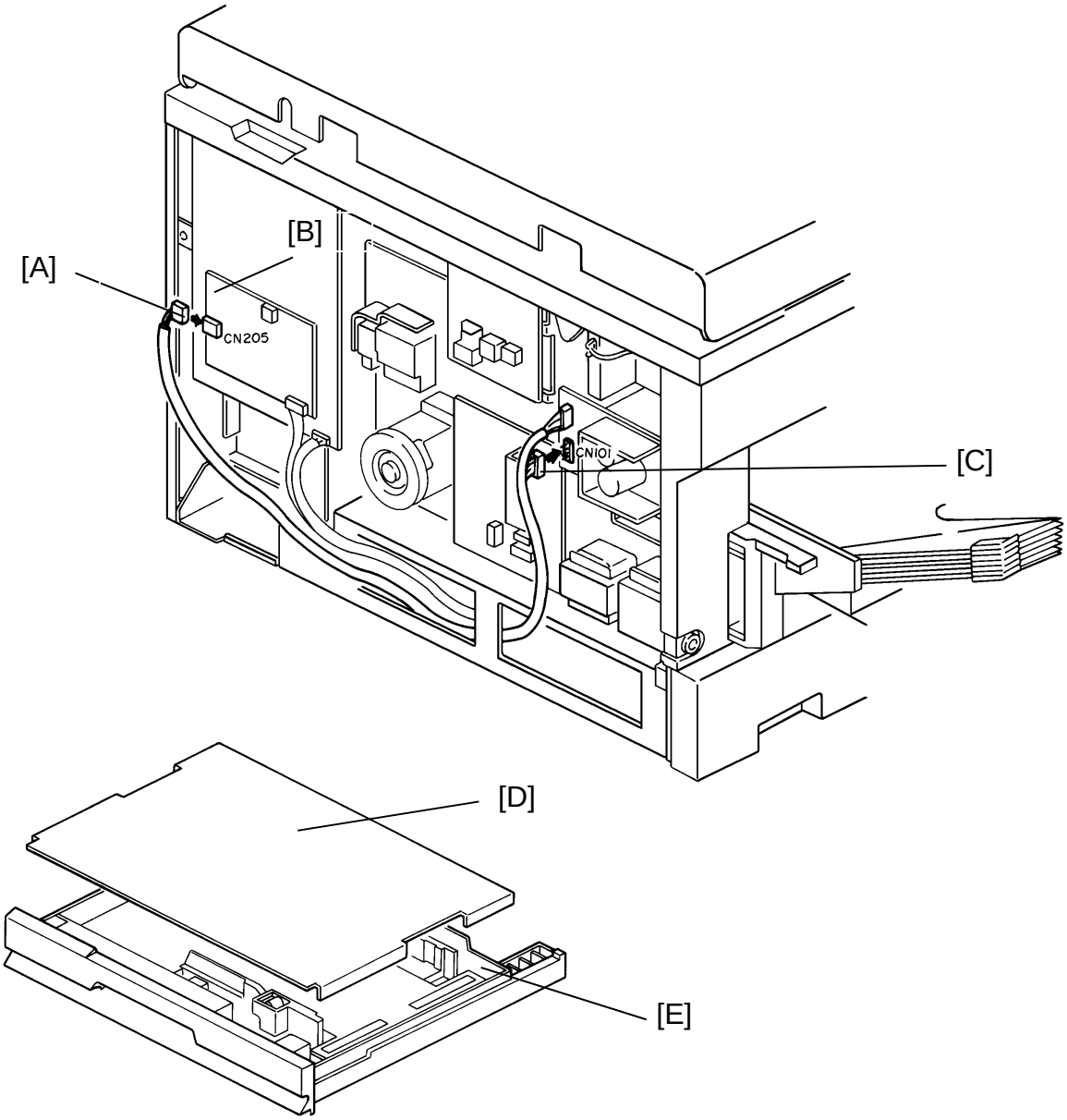


15. Remove the duplex connector cover plate [A] (2 screws).

    NOTE: The cover plate can be thrown away.
16. Secure the optional harness duplex connector (8P/Black) [B] to the connector bracket [C] (2 screws).

    NOTE: When installing the bracket, make sure that the cut-out [D] on the bracket faces up as shown.
17. Secure the connector bracket to the rear frame (2 shoulder screws).

    NOTE: Make sure that the duplex harness [E] does not interfere with lock solenoid movement.
18. Reinstall all the brackets.

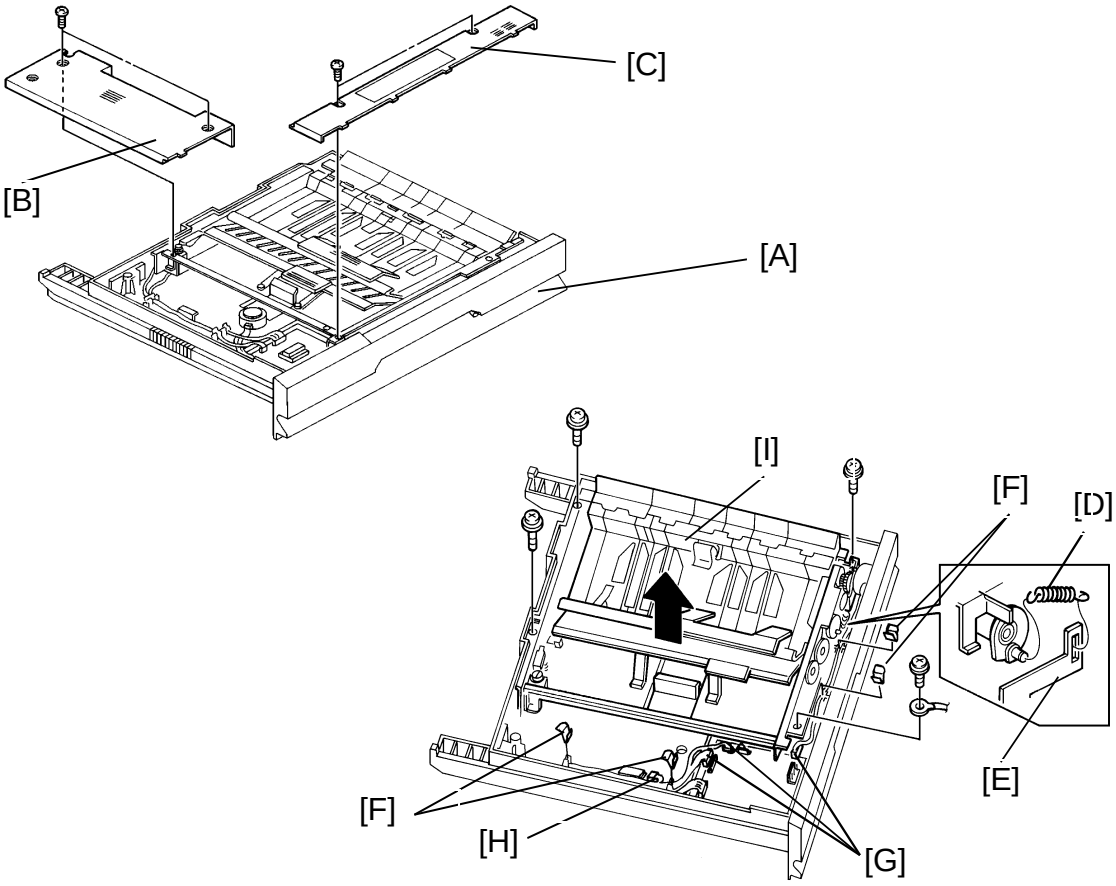


19. Connect the optional harness connector (4P/Black) [A] to CN205 on the interface board [B].
20. Connect the dc harness (4P/White) [C] to CN101 on the optional dc power supply unit.
21. Reinstall the rear cover (2 screws).
22. Insert the duplex unit into the copier.
23. Plug in the copier power supply cord and turn on the main switch.
24. Check the operation of the duplex unit.
25. Attach the tray cover [D] on the paper tray [E] as shown.

    NOTE: Explain to the customer how to install the tray cover.

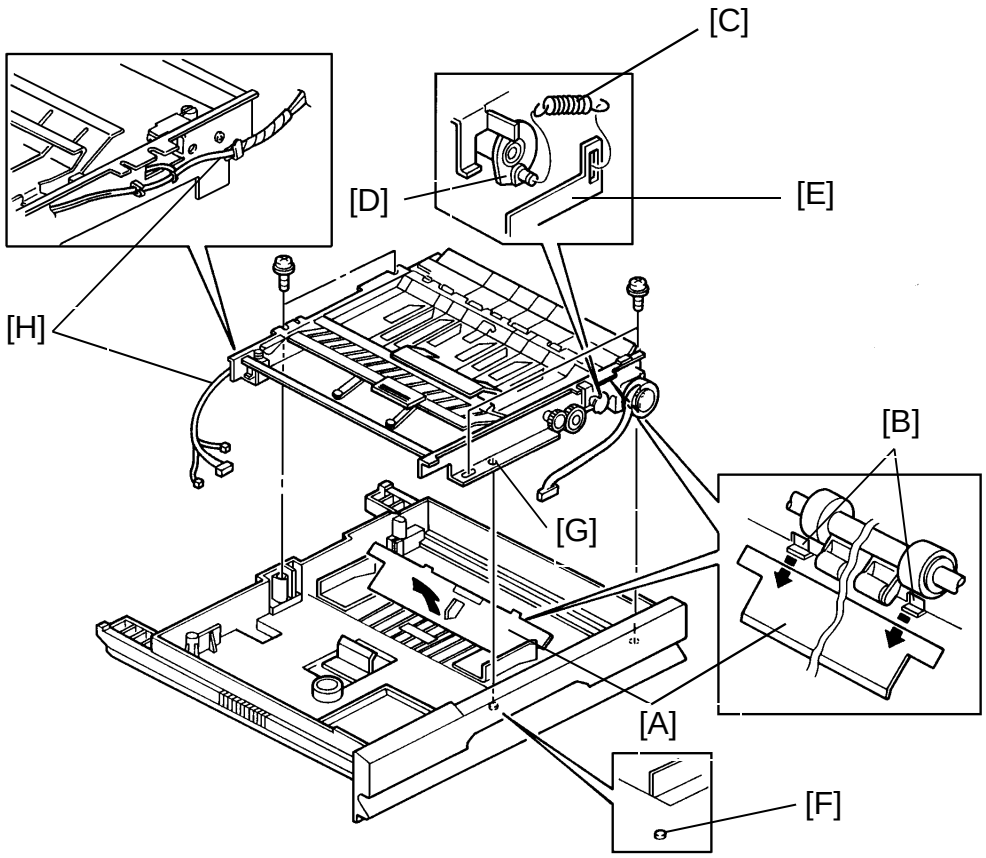
12. REPLACEMENT AND ADJUSTMENT

12.1 DUPLEX TRAY REMOVAL



1. Pull the duplex tray [A] out from the copier.
2. Remove the side inner cover [B] (3 screws).
3. Remove the front inner cover [C] (2 screws).
4. Unhook the pressure spring [D] from the paper lift arm [E] and the eccentric cam.
5. Remove the clamps [F] with a pair of plyers.
6. Disconnect CN702, CN704, and CN706 [G] from the main board.
7. Disconnect the sensor connector [H] from the jogger home pos. sensor.
8. Remove the duplex unit [I] (4 screws and grounding wire) from the tray.

NOTE: Hold both sides of the duplex unit frame when lifting the duplex unit out of the tray.



- Installation -

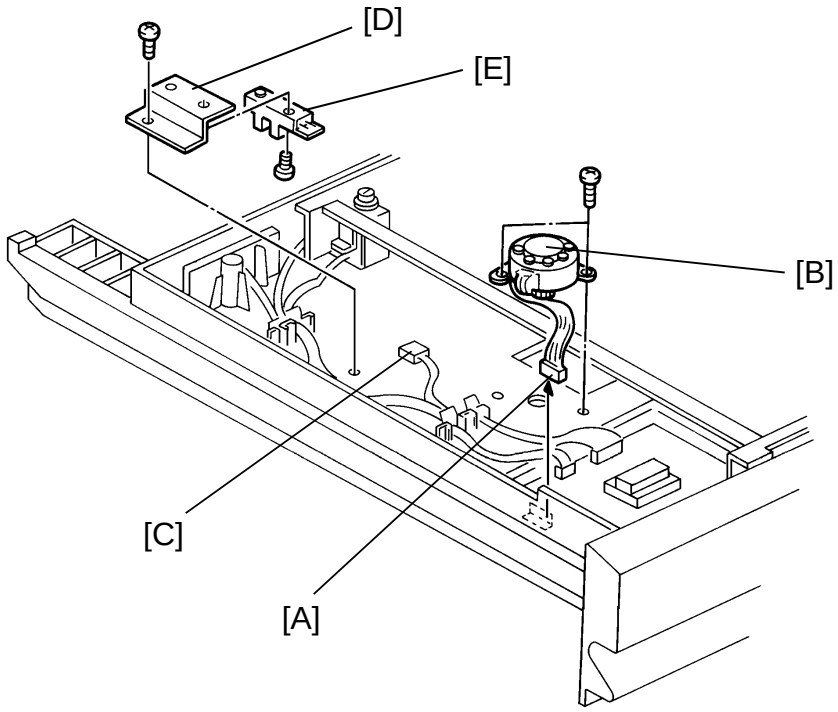
1. When placing the duplex unit back into the tray, hold up the bottom plate [A] so that the mylar brackets [B] fit under it as shown.
2. Hook the pressure spring [C] to the eccentric cam [D] and the paper lift arm [E] as shown.

NOTE: When installing the duplex unit, make sure of the following:

a) Positioning pin [F] fits through hole [G] in the side plate.

b) The sensor harness [H] is clamped correctly and is not caught under the unit frame.

12.2 JOGGER MOTOR AND JOGGER HOME POSITION SENSOR REPLACEMENT



1. Remove the duplex tray.
2. Remove the front and side inner covers.

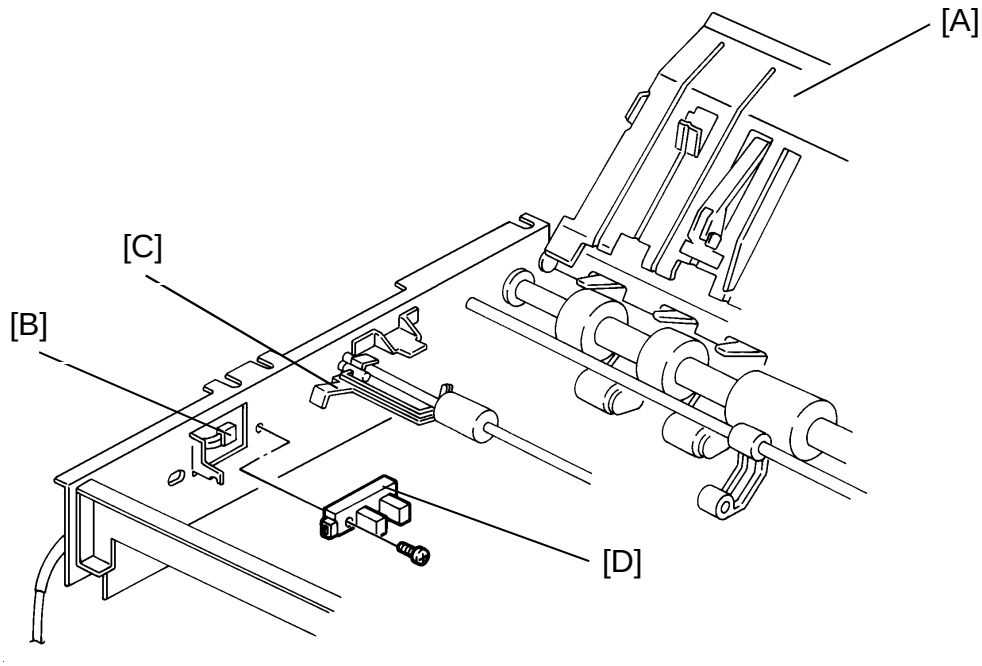
- Jogger Motor Replacement -

3. Disconnect CN705 [A] from the duplex main board.
4. Replace the jogger motor [B] (2 screws).

- Jogger Home Position Sensor Replacement -

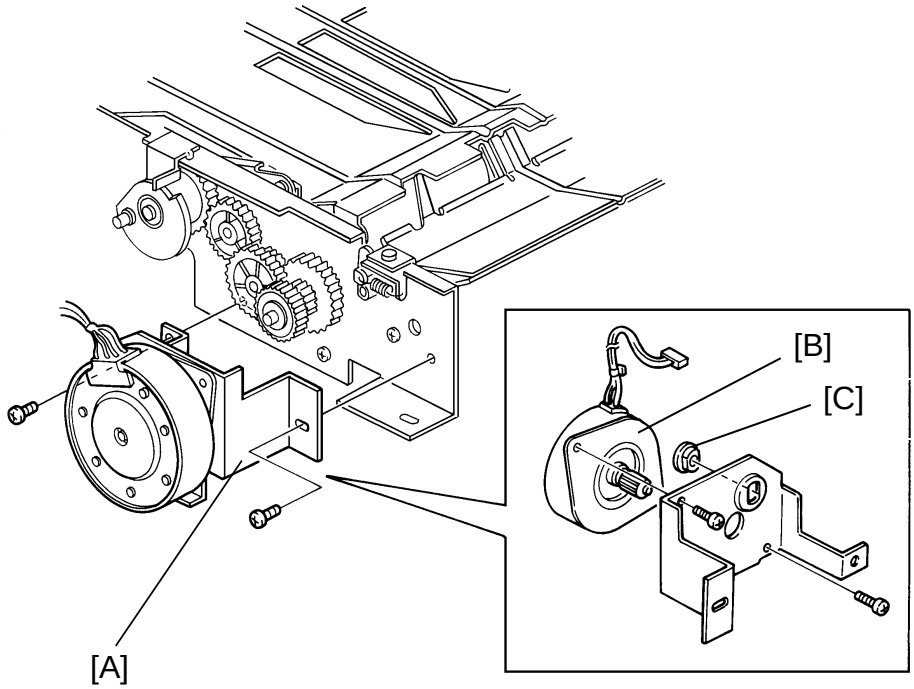
3. Disconnect the sensor connector [C].
4. Remove the sensor bracket [D] (1 screw).
5. Remove the sensor [E] from the bracket and replace it (1 screw).

12.3 TURN SENSOR REPLACEMENT



1. Remove the duplex tray.
2. Raise the upper and lower paper guides [A] all the way up.
3. Disconnect the turn sensor connector [B].
4. While lifting the sensor actuator [C], remove the sensor [D] (1 screw).

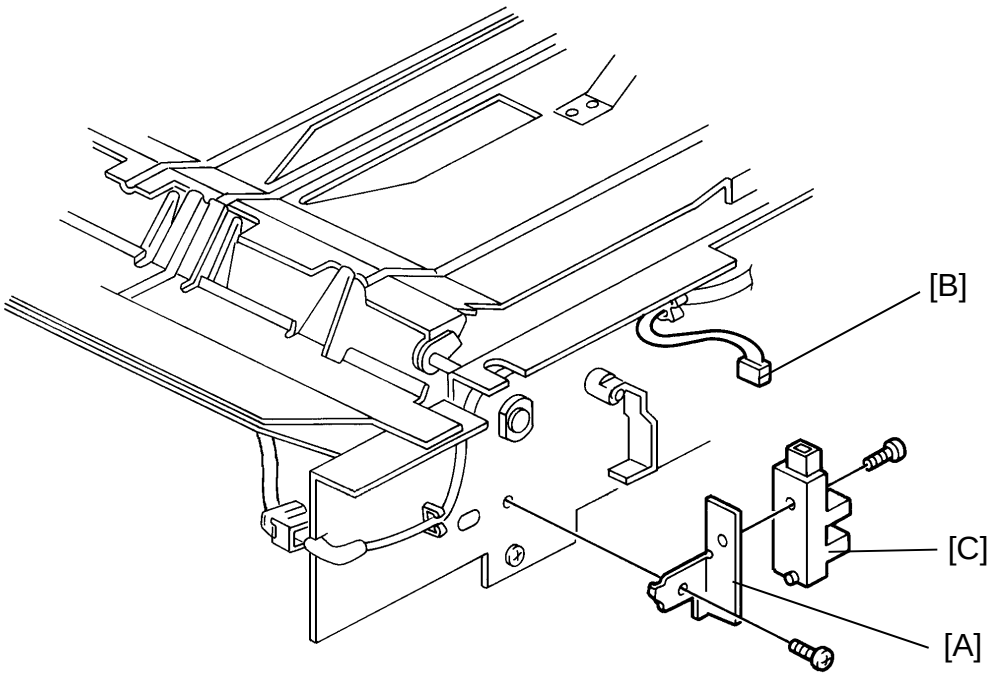
12.4 FEED MOTOR REPLACEMENT



1. Remove the duplex unit from the tray. (See Duplex Unit Removal.)
2. Remove the paper feed motor bracket [A] (2 screws).
3. Replace the feed motor [B] (2 screws).

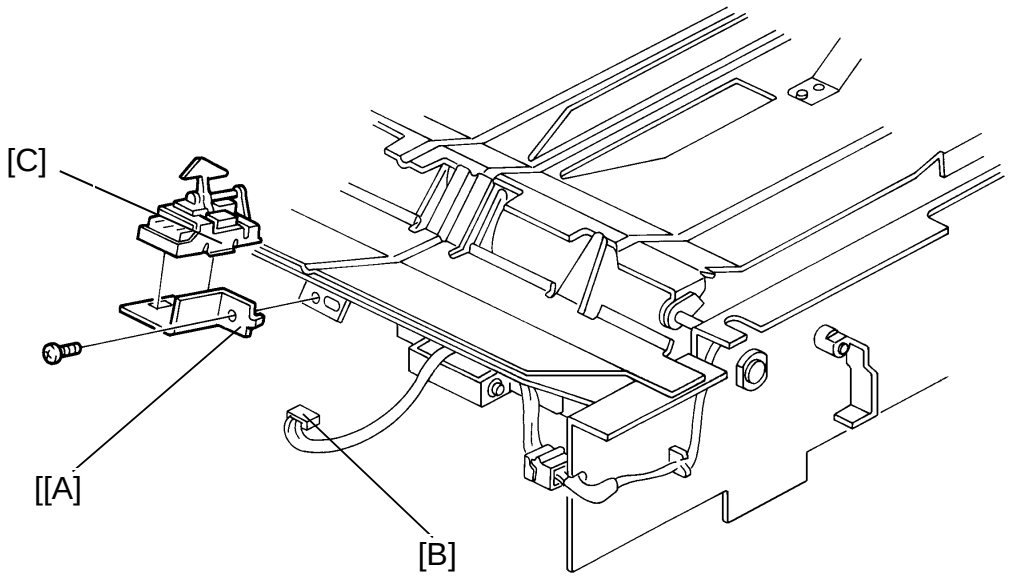
NOTE: When installing the paper feed motor, make sure that the bushing [C] is properly positioned between the bracket and the motor as shown.

12.5 PAPER END SENSOR REPLACEMENT



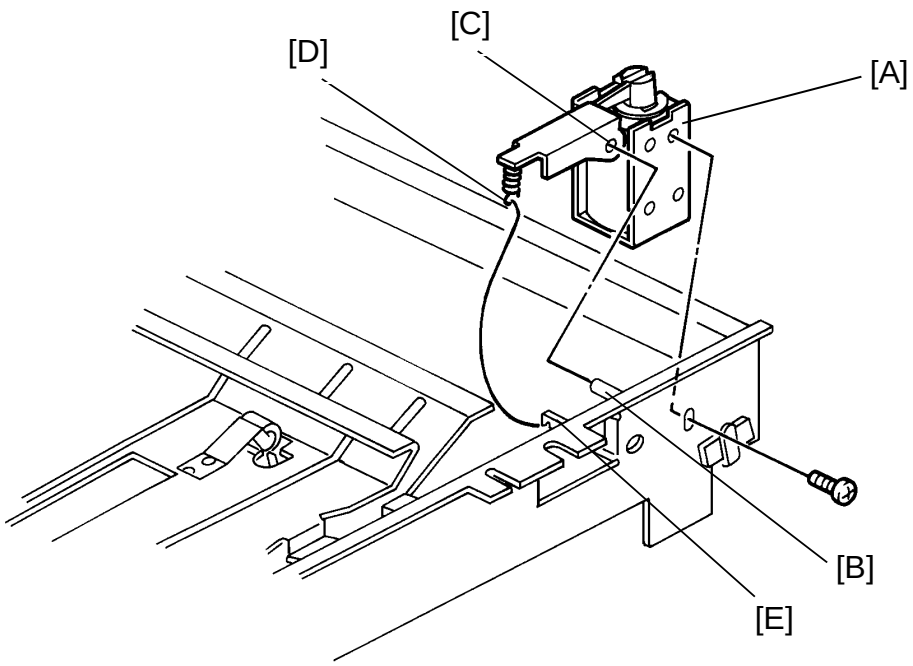
1. Remove the duplex unit from the tray. (See Duplex Unit Removal.)
2. Remove the paper end sensor bracket [A] (1 screw).
3. Disconnect the sensor connector [B].
4. Replace the sensor [C] (1 screw).

12.6 ENTRANCE SENSOR REPLACEMENT



1. Remove the duplex unit from the tray. (See Duplex Unit Removal.)
2. Turn over the duplex unit as shown.
3. Remove the entrance sensor bracket [A] (1 screw).
4. Disconnect the sensor connector [B].
5. Replace the sensor [C].

12.7 GATE SOLENOID REPLACEMENT



1.Remove the duplex unit from the tray. (See Duplex Unit Removal.)

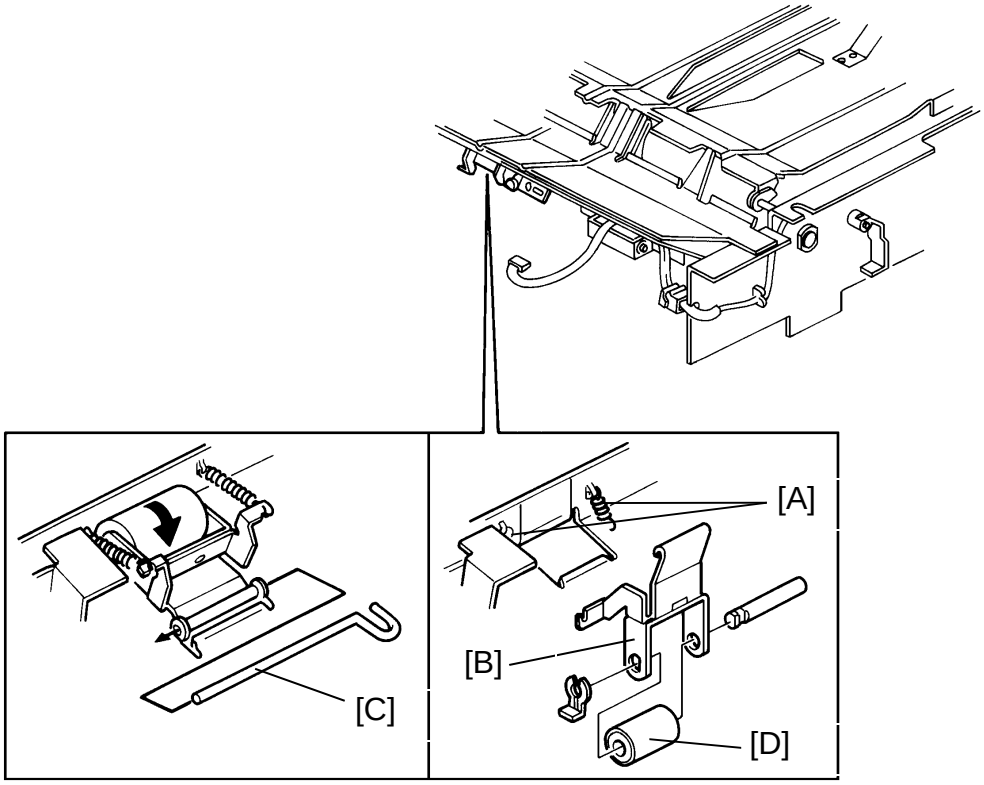
2. Replace the gate solenoid [A] (1 screw).

NOTE: When installing a new solenoid, make sure of the following:

a) Positioning pin [B] fits into the hole [C] on the gate solenoid actuator.

b) Spring [D] is hooked to bracket [E].

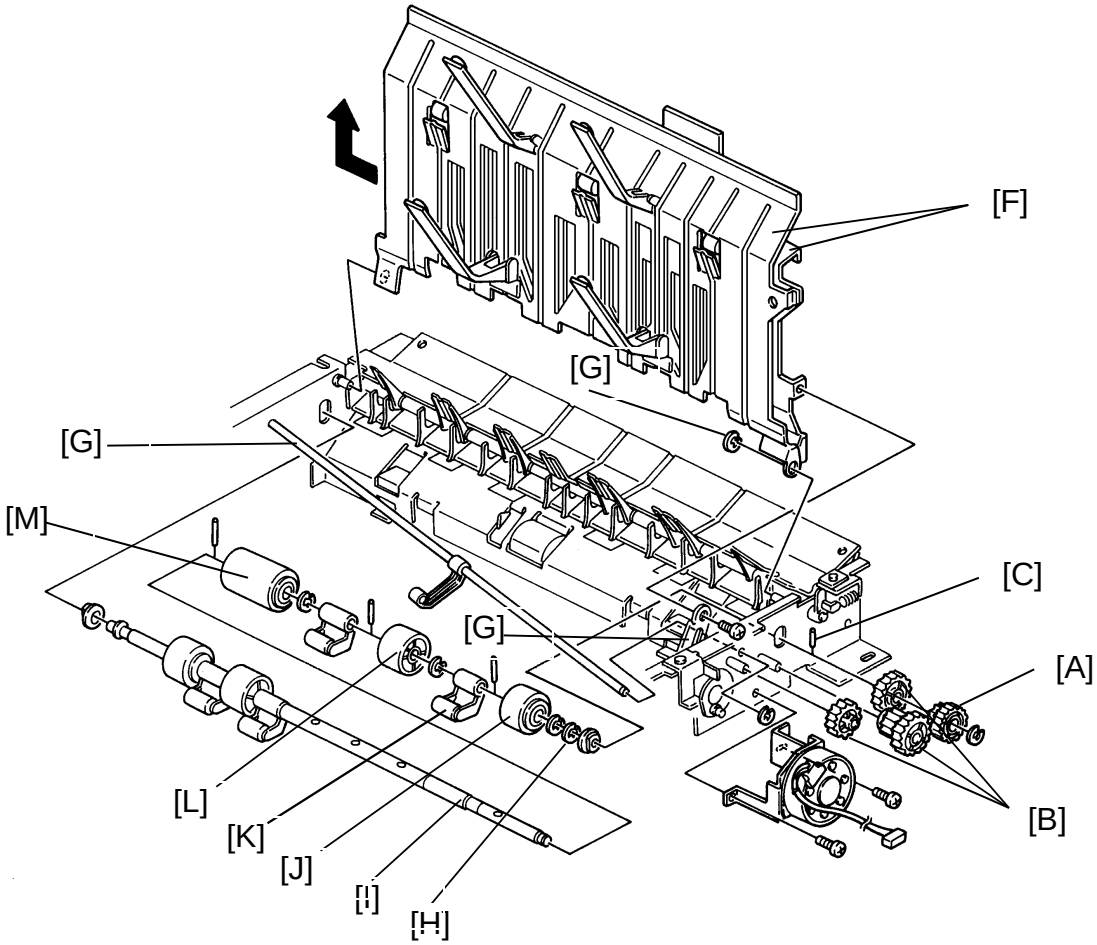
12.8 FRICTION ROLLER REPLACEMENT



1. Remove the duplex unit from the tray. (See Duplex Unit Removal.)
2. Turn over the duplex unit as shown.
3. Unhook the springs [A] from the roller bracket [B].
4. Remove the lock pin [C] and the roller assembly.
5. Remove the roller [D] (1 snap-ring and shaft) from the bracket and replace it.

NOTE: This friction roller has a one-way clutch. Be sure to install the roller so that it rotates in the direction of the arrow. (See illustration.)

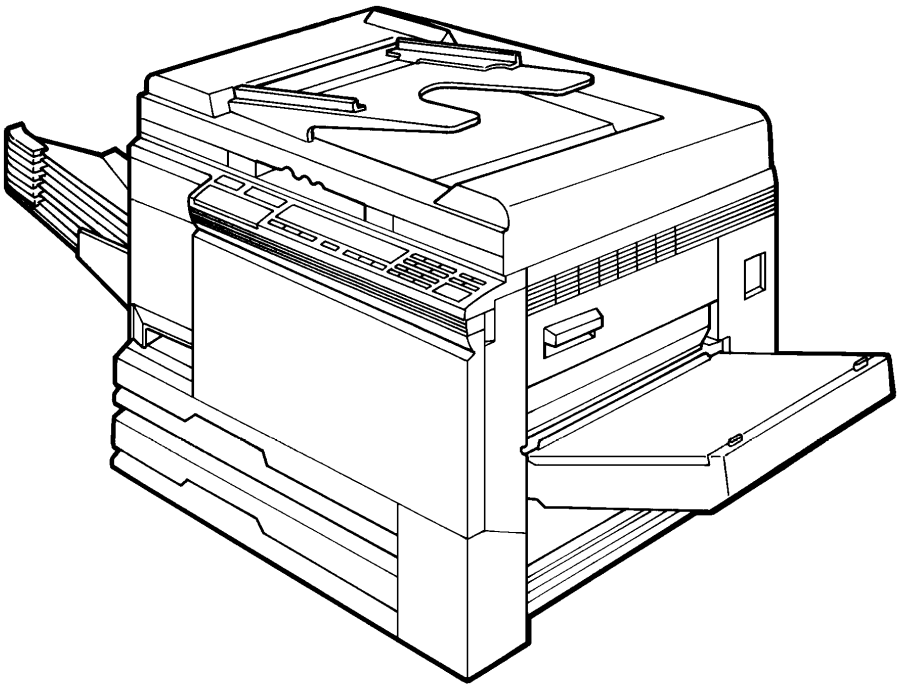
12.9 FEED ROLLER REPLACEMENT



1. Remove the duplex unit from the tray. (See Duplex Unit Removal.)
2. Remove the feed motor. (See Feed Motor Replacement.)
3. Remove the drive gear [A] (1 E-ring) and three idle gears [B] (1 parallel pin [C]).
4. Remove the E-ring [D] and the upper paper guide plate stopper [E] (1 shoulder screw).
5. Remove the upper and lower guide paper plates [F].
6. Remove the paper end feeler shaft [G] (1 E-ring).
7. Remove the E-ring [H] on the front side of the feed roller shaft [I].
8. Remove the feed roller shaft (2 bushings).
9. Remove the feed support roller [J], flatter [K], paper retainer [L]; then, replace the feed roller [M] (1 E-ring and parallel pin per roller).

SECTION 11

FT4421
SERVICE MANUAL



In this section, the FT4418 is referred to as the A048 copier, and the FT4421 is referred to as the A054 copier.

1. SPECIFICATIONS

Configuration:	Desk top
Copy Process:	Dry electrostatic transfer system
Originals:	Sheet/Book
Original Size:	Maximum A3/11"x17"
Copy Paper Size:	Maximum A3/11"x17" Minimum A6/5 1/2" x 8 1/2" (lengthwise)
(Duplex Copying)	A4 and B5/8 1/2" x 11" (sideways)
Copy Paper Weight:	Cassette feed: 52 to 157 g/m^2 (14 to 42 lb) Paper tray feed: 64 to 90 g/m^2 (17 to 22 lb) Manual feed: 52 to 157 g/m^2 (14 to 42 lb) Duplex: 59 to 104 g/m^2 (16 to 27 lb)
Reproduction Ratio:	2 Enlargement and 3 Reduction

	A4/A3 Version	LT/LDG Version
Enlargement	141% 122%	155% 129%
Full size	100%	100%
Reduction	93% 82% 71%	93% 74% 65%

Zoom:	From 50% to 200% in 1% steps	
Copying Speed:	European version:	20 copies/minute (A4 sideways) 11 copies/minute (A3)
	Other versions:	21 copies/minute (A4/8 1/2" x 11" sideways) 11 copies/minute (A3)
Warm-Up Time:	60 seconds (at 20°C)	
First Copy Time:	5.9 seconds (A4/8 1/2" x 11" sideways)	
Copy Number Input:	Ten keys, 1 to 99 (count up)	
Manual Image Density Selection:	7 steps	

Automatic Reset: 1 minute standard setting; can also be set to 3 minutes or no auto reset.

Paper Capacity:
Cassette: 500 sheets
Paper tray: 250 sheets
Manual feed table: 50 sheets

Toner Replenishment:
Black: Cartridge exchange (370g/cartridge)
Color (red, blue, & green): Cartridge exchange (310g/cartridge)

Copy Tray Capacity:
250 sheets (B4/8 1/2" x 14" and smaller)
100 sheets (A3/11" x 17")

Power Source:
110V/ 60Hz/ 15A (for Taiwan)
115V/ 60Hz/ 15A (for N.A.)
220V/ 50Hz/ 8A (for EU.)
220V/ 60Hz/ 8A (for EU.)
240V/ 50Hz/ 8A (for EU.)
(Refer to the serial number plate (rating plate) to determine the power source required by the machine.)

Power Consumption:
Maximum: 1.3 kw
Warm-up: 0.72 kw (average)
Ready: 0.16 kw (average)
Copy cycle: 0.83 kw (average)

Dimensions:

	Width	Depth	Height
Copier only	672 mm (26.5")	600 mm (23.7")	530 mm (20.9")
Full system	1149 mm (45.3")	600 mm (23.7")	633 mm (25.0")

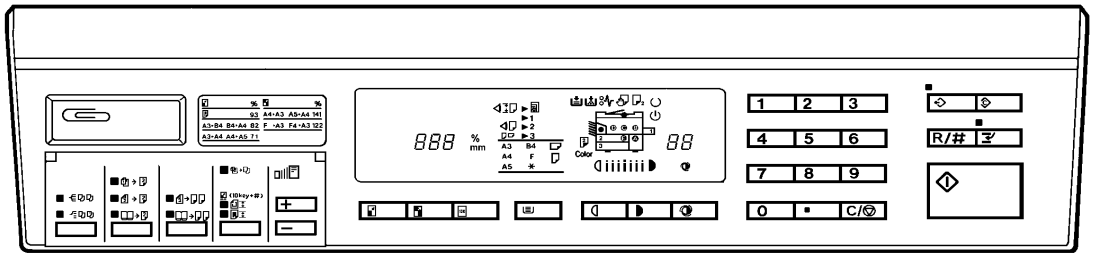
Weight:
Copier only: European version 69 kg (152.1lb)
Other versions 66 kg (145.5lb)
Full system: 86.5 (190.7lb)

Optional Equipment:
Document feeder
10 bin sorter
Duplex unit (standard for European version)
Color development unit
Key counter
Universal cassette

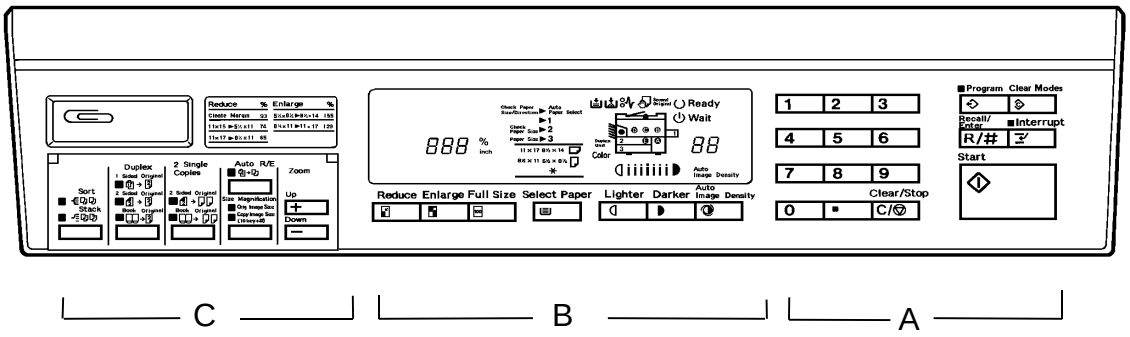
- Specifications are subject to change without notice.

2. OPERATION PANEL

— A4/A3 Version —



— LT/LDG Version —



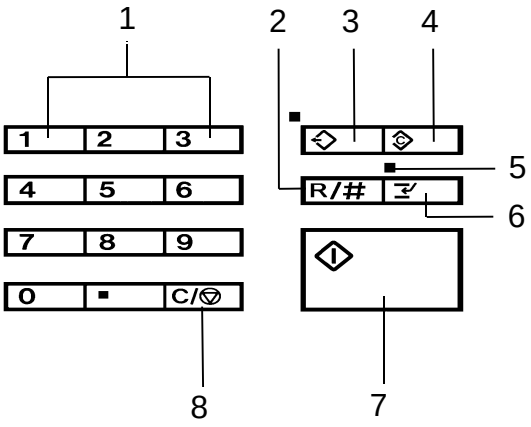
Section A: See page 11-4.

Section B: See page 1-5 or 1-6.

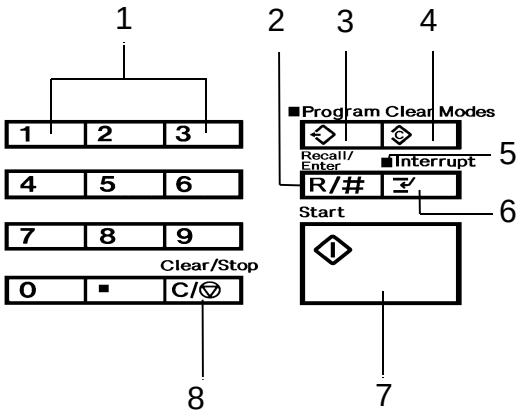
Section C: See page 1-7 or 1-8.

Section A —

— A4/A3 Version —



— LT/LDG Version —



1. Number Keys
The number keys are used to enter the desired number of copies. They are also used to input the sizes of the original and the copy image when in size magnification mode.

2. Recall/Enter Key
Press to display the number of copies entered. Also use to enter or change data when in size magnification mode.

3. Program Key
Press to input or recall user programs.

4. Clear Modes Key
Press to clear all previously entered settings and modes.

5. Interrupt Indicator
Lights when interrupt mode is selected.

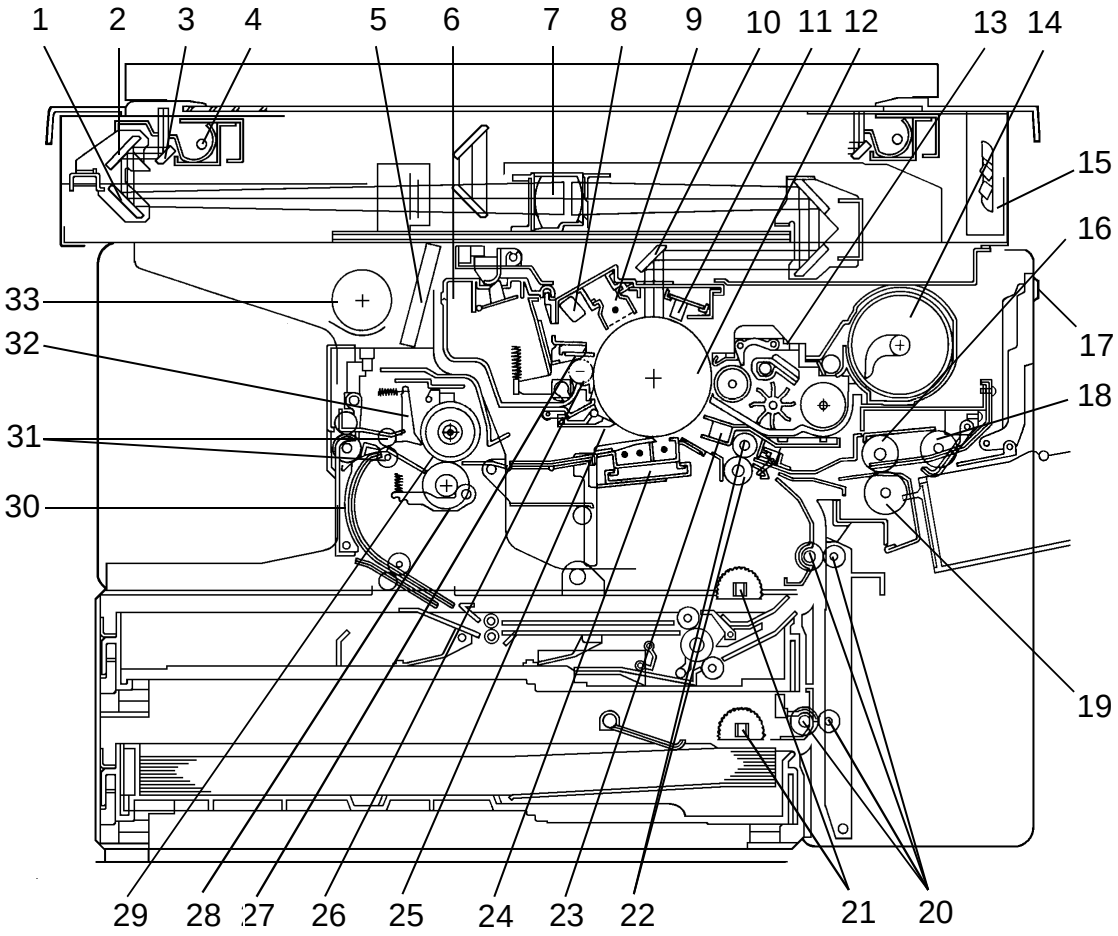
6. Interrupt Key
Press to make interrupt copies during a copy run.

7. Start Key
Press to start copying.

8. Clear/Stop Key
Press to cancel the copy number entered. While copying, press to stop copying.

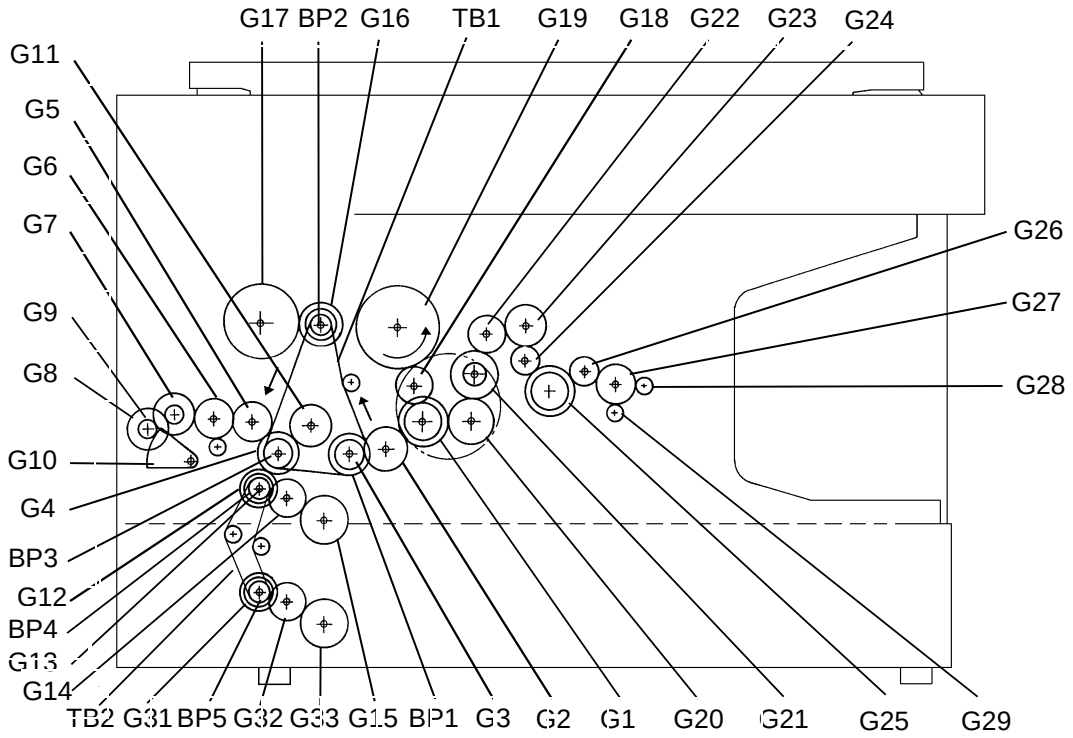
3. FUNCTIONAL OPERATION

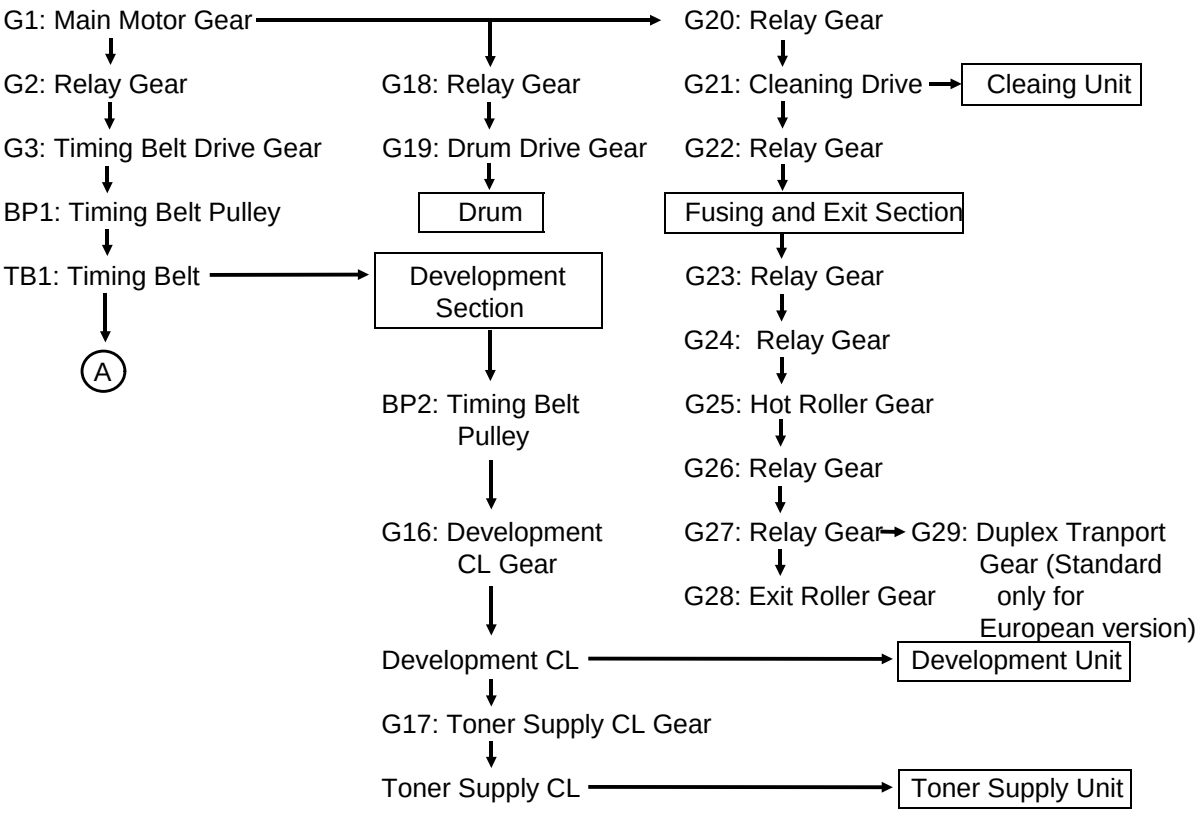
4. MECHANICAL COMPONENT LAYOUT

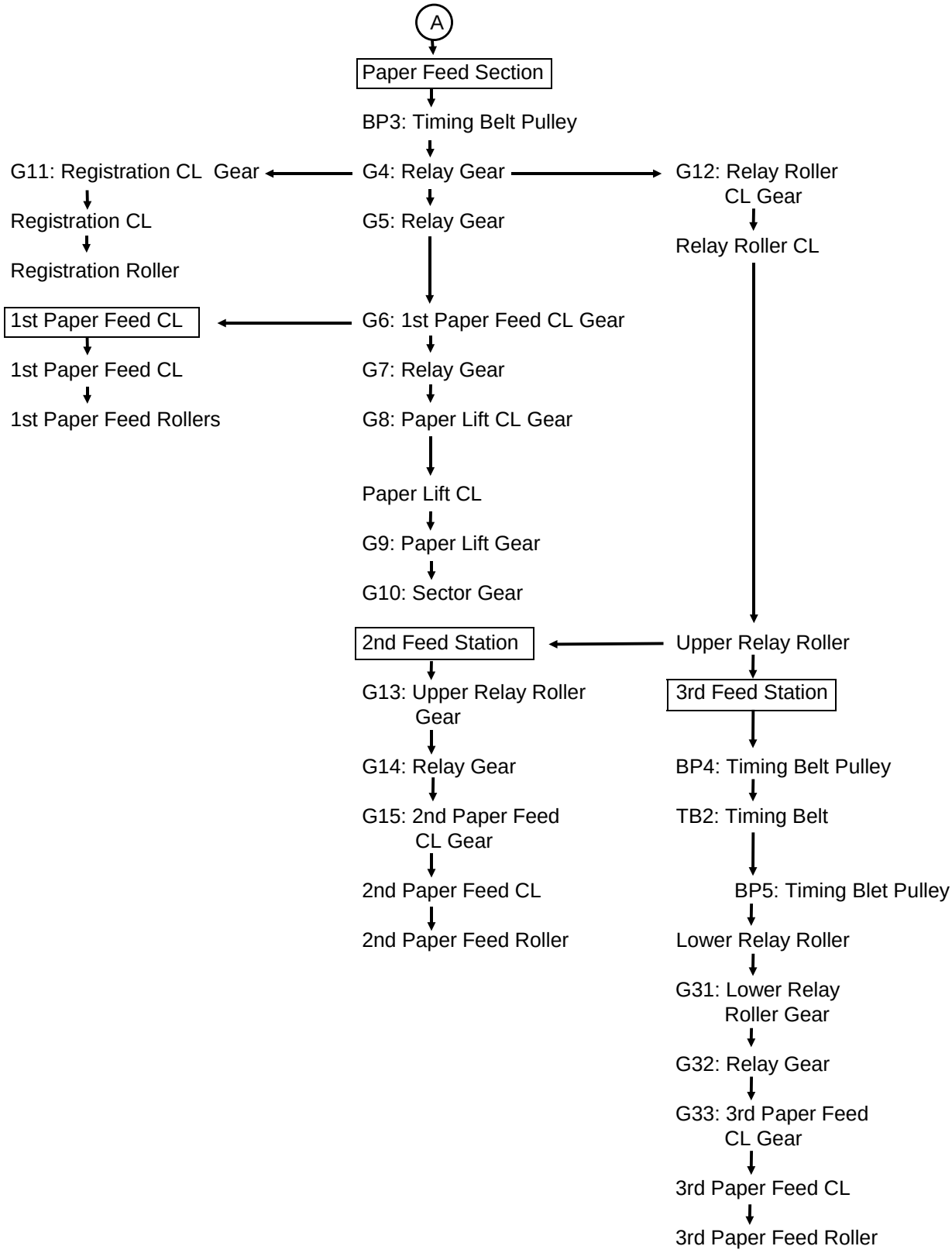


1. Third Mirror
2. Second Mirror
3. First Mirror
4. Exposure Lamp
5. Ozone Filter
6. Cleaning Unit
7. Lens
8. Quenching Lamp (QL)
9. Charge Corona Unit
10. Sixth Mirror
11. Erase lamp (EL)
12. OPC Drum
13. Development Unit
14. Toner Supply Unit
15. Optics Cooling Fans
16. Feed Roller
17. Manual Feed Table
18. Pick-up Roller
19. Separation Roller
20. Relay Rollers
21. Semi-circular Feed Rollers
22. Registration Rollers
23. Pre-transfer Lamp (PTL)
24. Transfer and Separation Corona Unit
25. Pick-off Pawls
26. Cleaning Brush
27. Cleaning Blade
28. Pressure Roller
29. Hot Roller
30. Duplex Turn Guide (Standard only for European version)
31. Exit Rollers
32. Hot Roller Strippers
33. Exhaust Blower

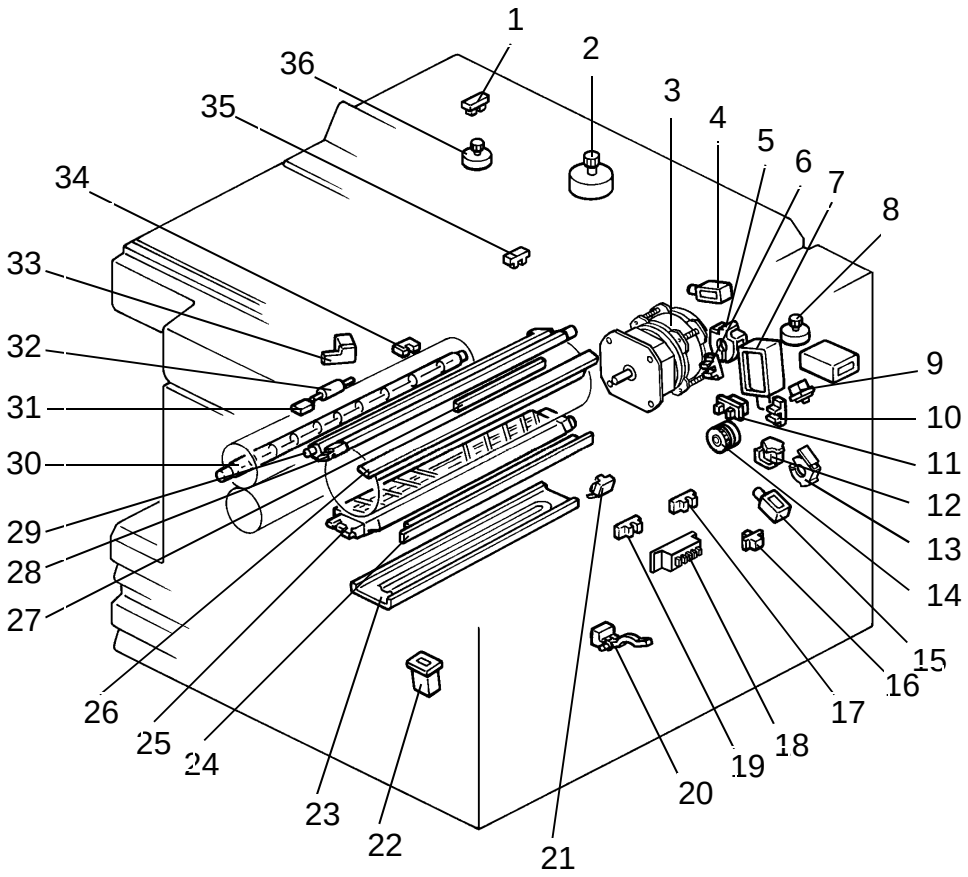
5. DRIVE LAYOUT



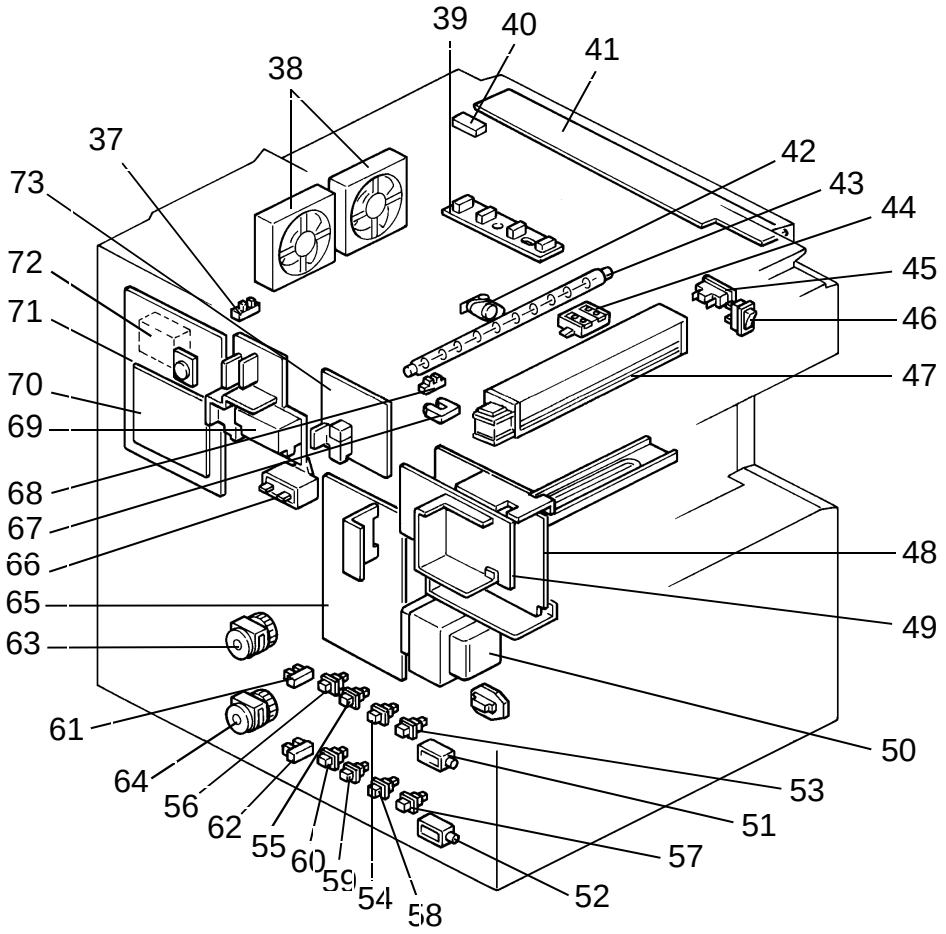



A
Paper Feed Section
BP3: Timing Belt Pulley
G4: Relay Gear
G11: Registration CL Gear
G12: Relay Roller CL Gear
Registration CL
Registration Roller
G5: Relay Gear
Relay Roller CL
1st Paper Feed CL
G6: 1st Paper Feed CL Gear
1st Paper Feed CL
1st Paper Feed Rollers
G7: Relay Gear
G8: Paper Lift CL Gear
Paper Lift CL
G9: Paper Lift Gear
G10: Sector Gear
2nd Feed Station
Upper Relay Roller
3rd Feed Station
G13: Upper Relay Roller Gear
G14: Relay Gear
G15: 2nd Paper Feed CL Gear
2nd Paper Feed CL
2nd Paper Feed Roller
BP4: Timing Belt Pulley
TB2: Timing Belt
BP5: Timing Blet Pulley
Lower Relay Roller
G31: Lower Relay Roller Gear
G32: Relay Gear
G33: 3rd Paper Feed CL Gear
3rd Paper Feed CL
3rd Paper Feed Roller

6. ELECTRICAL COMPONENT LAYOUT



1. Scanner H.P. Sensor
2. Scanner Motor
3. Main Motor
4. Development CL Sol.
5. Toner Supply CL Sol.
6. Toner End Sensor
7. Pick-up Roller Release Sol.
8. 4th/5th Mirror Motor
9. Manual Feed Table SW
10. Development Unit Set Sensor
11. Color Switch
12. 1st Paper Feed CL Sol.
13. Paper Lift CL Sol.
14. Registration Clutch
15. Relay Roller CL Sol.
16. Right Cover SW
17. 1st Paper End Sensor
18. 1st Paper Size SW
19. Paper Lift Sensor
20. Relay Sensor
21. Registration Sensor
22. Total Counter
23. Drum Anti-condensation Heater
24. Pre-transfer Lamp (PTL)
25. Transfer and Separation Corona Unit
26. Erase Lamp (EL)
27. ID Sensor
28. Charge Corona Unit
29. Quenching Lamp (QL)
30. Fusing Lamp
31. Fusing Thermister
32. Fusing Thermofuse
33. Auto ID Sensor
34. Toner Overflow Sensor
35. Exit Sensor
36. Lens Motor



37. 4th/5th Mirror H.P. Sensor
38. Optics Cooling Fan Motors
39. Original Length Sensor
40. Platen Cover Closed SW
41. Operation Panel Board
42. Optics Thermoswitch
43. Exposure Lamp
44. Original Width Sensor
45. Cover Safety SW
46. Main SW
47. Exhaust Blower Motor
48. Main DC Power Supply Board
49. Option DC Power Supply Board
50. Main Transformer
51. Upper Tray Lock Sol.
52. Lower Tray Lock Sol.
53. 2nd Paper Size SW-4 (SW7)
54. 2nd Paper Size SW-3 (SW6)
55. 2nd Paper Size SW-2 (SW5)
56. 2nd Paper Size SW-1 (SW4)
57. 3rd Paper Size SW-4 (SW14)
58. 3rd Paper Size SW-3 (SW13)
59. 3rd Paper Size SW-2 (SW12)
60. 3rd Paper Size SW-1 (SW11)
61. 2nd Paper End Sensor
62. 3rd Paper End Sensor
63. 2nd Paper Feed CL Sol.
64. 3rd Paper Feed CL Sol.
65. Main Motor Capacitor
66. AC Drive Board
67. Platen Cover Position Sensor
68. Lens H.P. Sensor
69. TC/SC Power Pack
70. Interface Board
71. Main Board
72. Key Counter (Option)
73. CC/Grid/Bias Power Pack

7. ELECTRICAL COMPONENT DESCRIPTIONS

SYMBOL	NAME	FUNCTION	INDEX NO.
Motors			
M1	Main Motor	Drives all the main unit components except for the optics unit and fans. (115/220/240Vac)	3
M2	Scanner Motor	Drives the scanners (1st and 2nd). (dc stepper)	2
M3	Lens Motor	Moves the lens position according to the selected magnification. (dc stepper)	36
M4	4th/5th Mirror Motor	Move the 4th/5th mirror position according to the selected magnification. (dc stepper)	8
M5	Optics Cooling Fan Motor-1	Prevents built up of hot air in the optics cavity. (24 Vdc)	38
M6	Optics Cooling Fan Motor-2	Prevents built up of hot air in the optics cavity. (24 Vdc)	38
M7	Exhaust Blower Motor	Removes heat from around the fusing unit and blower the ozone built up around the charge section to the ozone filter.	47
Magnetic Clutches			
MC1	Registration Clutch	Drives the registration roller.	14
Solenoids			
SOL1	Toner Supply Clutch Solenoid	Drives the toner supply roller via the toner supply spring clutch.	5
SOL2	1st Paper Feed Clutch Solenoid	Starts paper feed from the first paper station.	12
SOL3	2nd Paper Feed Clutch Solenoid	Starts paper feed from the 2nd paper station.	63
SOL4	Pick-up Roller Release Solenoid	a) After the paper is fed, releases the pick-up roller from next paper. b) When the manual feed table is used, releases the pick-up roller from the table.	7
SOL5	Paper Lift Clutch Solenoid	Lifts paper to the appropriate feed position.	13
SOL6	Upper Tray Lock Solenoid	Locks the upper paper tray/duplex unit.	51
SOL7	Development Clutch Solenoid	Drives the development unit.	4
SOL8	Relay Roller Clutch Solenoid	Drives the relay roller for the 2nd cassette station.	15

SYMBOL	NAME	FUNCTION	INDEX NO.
SOL9	3rd Paper Feed Clutch Solenoid	Starts paper feed from the 3rd paper station.	64
SOL10	Lower Tray Lock Solenoid	Locks the lower paper tray.	52

Switches

SW1	Main Switch	Supplies power to the copier.	46
SW2	Cover Safety Switch	Cuts the ac power line.	45
SW3	1st Paper Size Switch	Determines what size paper is in the cassette.	18
SW4	2nd Paper Size Switch-1	Determines what size paper is in the upper paper tray.	56
SW5	2nd Paper Size Switch-2	Determines what size paper is in the upper paper tray.	55
SW6	2nd Paper Size Switch-3	Determines what size paper is in the upper paper tray.	54
SW7	2nd Paper Size Switch-4	Determines what size paper is in the upper paper tray.	53
SW8	Color Switch	Determines which color development unit is installed.	11
SW9	Manual Feed Table Switch	Detects when the manual feed table is open.	9
SW10	Right Cover Switch	Detects when the right cover is open.	16
SW11	3rd Paper Size Switch-1	Determines what size paper is in the lower tray.	60
SW12	3rd Paper Size Switch-2	Determines what size paper is in the lower tray.	59
SW13	3rd Paper Size Switch-3	Determines what size paper is in the lower tray.	58
SW14	3rd Paper Size Switch-4	Determines what size paper is in the lower tray.	57
SW15	Platen Cover Closed Switch	Detects when the platen cover or the document feeder is closed.	40

Sensors

S1	Scanner Home Position Sensor	Informs the CPU when the 1st scanner is at the home position.	1
S2	Lens Home Position Sensor	Informs the CPU when the lens is at the home position (full size position).	68

SYMBOL	NAME	FUNCTION	INDEX NO.
S3	4th/5th Mirror Home Position Sensor	Informs the CPU when the 3rd scanner (4th/5th mirrors assembly) is at the home position (full size position).	37
S4	Registration Sensor	Detects misfeeds.	21
S5	Exit Sensor	Detects misfeeds.	35
S6	1st Paper End Sensor	Informs CPU when the cassette runs out of paper.	17
S7	2nd Paper End Sensor	Informs CPU when the upper paper tray runs out of paper.	61
S8	Toner End Sensor	Detects when it is time to add toner.	6
S9	Toner Overflow Sensor	Detects when the used toner tank is full.	34
S10	Paper Lift Sensor	Detects the correct feed height of the cassette.	19
S11	Image Density (ID) Sensor	Detects the density of the image on the drum to control the toner density.	27
S12	Development Unit Set Sensor	Sensors whether or not the development unit is properly set.	10
S13	3rd Paper End Sensor	Informs CPU when the lower paper tray runs out of paper.	62
S14	Relay Sensor	Detects imsfeeds.	20
S15	Platen Cover Position Sensor	Detects when the platen cover is positioned about 10 cm (4") above the exposure glass.	67
S16	Original Width Sensor	Detects the original width.	44
S17	Original Length Sensor	Detects the original length.	39

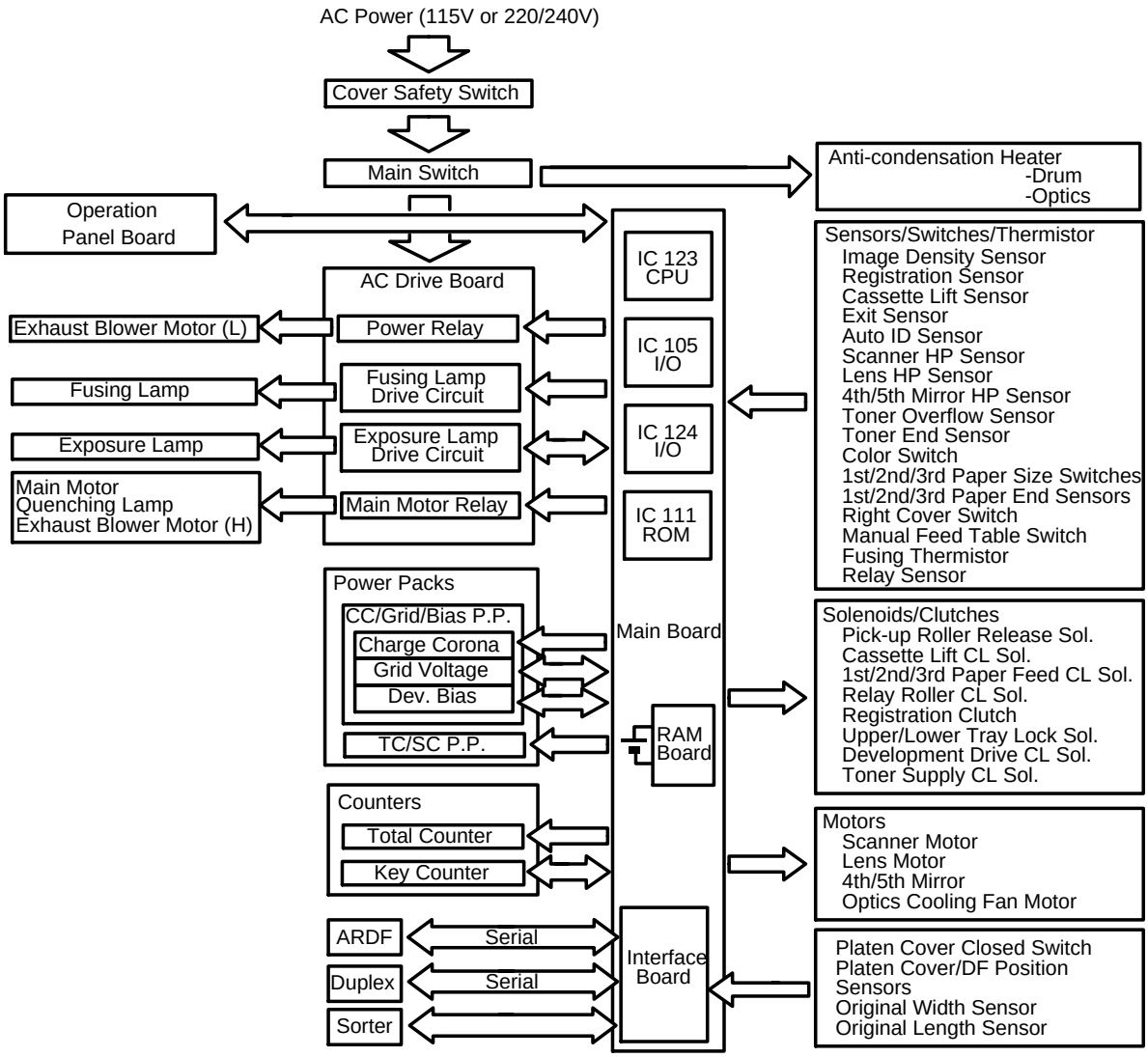
Printed Circuit Boards

PCB1	Main Board	Controls all copier functions both directly and through the other PCBs.	71
PCB2	AC Drive Board	Drives all ac motors, the exposure lamp, fusing lamp, quenching lamp, exhaust blower motor.	65
PCB3	Main DC Power Supply Board	Rectifies 26 and 10 Vac input and outputs dc voltages.	48
PCB4	Auto Image Density Sensor (ADS)	Senses the background density of the original.	33

SYMBOL	NAME	FUNCTION	INDEX NO.
PCB5	Option DC Power Supply Board	Rectifies 26 and 10 Vac input and outputs dc voltasges.	49
PCB6	Interface Board	Interfaces between the copier main board and all the optional equipment's main board.	70
PCB7	Operation Panel Board	Informs the CPU of the selected modes and displays the situations on the panel.	41
Lamps			
L1	Exposure Lamp	Applies high intensity light to the original for exposure.	43
L2	Fusing Lamp	Provides heat to the hot roller.	30
L3	Quenching Lamp	Neutralizes any charge remaining on the drum surface after cleaning.	29
L4	Erase Lamp	Discharge the drum outside of the image area. Provides leading/trailing edge erase.	26
L5	Pre-transfer Lamp	Reduces charge on the drum surface before transfer.	24
Power Packs			
P1	CC/Grid/Bias Power Pack	Provides high voltage for the charge corona, grid, and the development roller bias.	73
P2	TC/SC Power Pack	Provides high voltage for the transfer and separation corona.	69
Heaters			
H1	Drum Anti-condensation Heater	Prevents moisture around the drum.	23
H2	Optics Anti-condensation Heater Option	Prevents moisture from forming on the optics.	N/A
Counters			
CO1	Total Counter	Keeps track of the total number of copies made.	22
CO2	Key Counter (Option)	Used for control of authorized use. Copier will not operate until installed.	72
Transformer			
TR1	Main Transformer	Steps down the wall voltage to 26 Vac and 10 Vac.	50

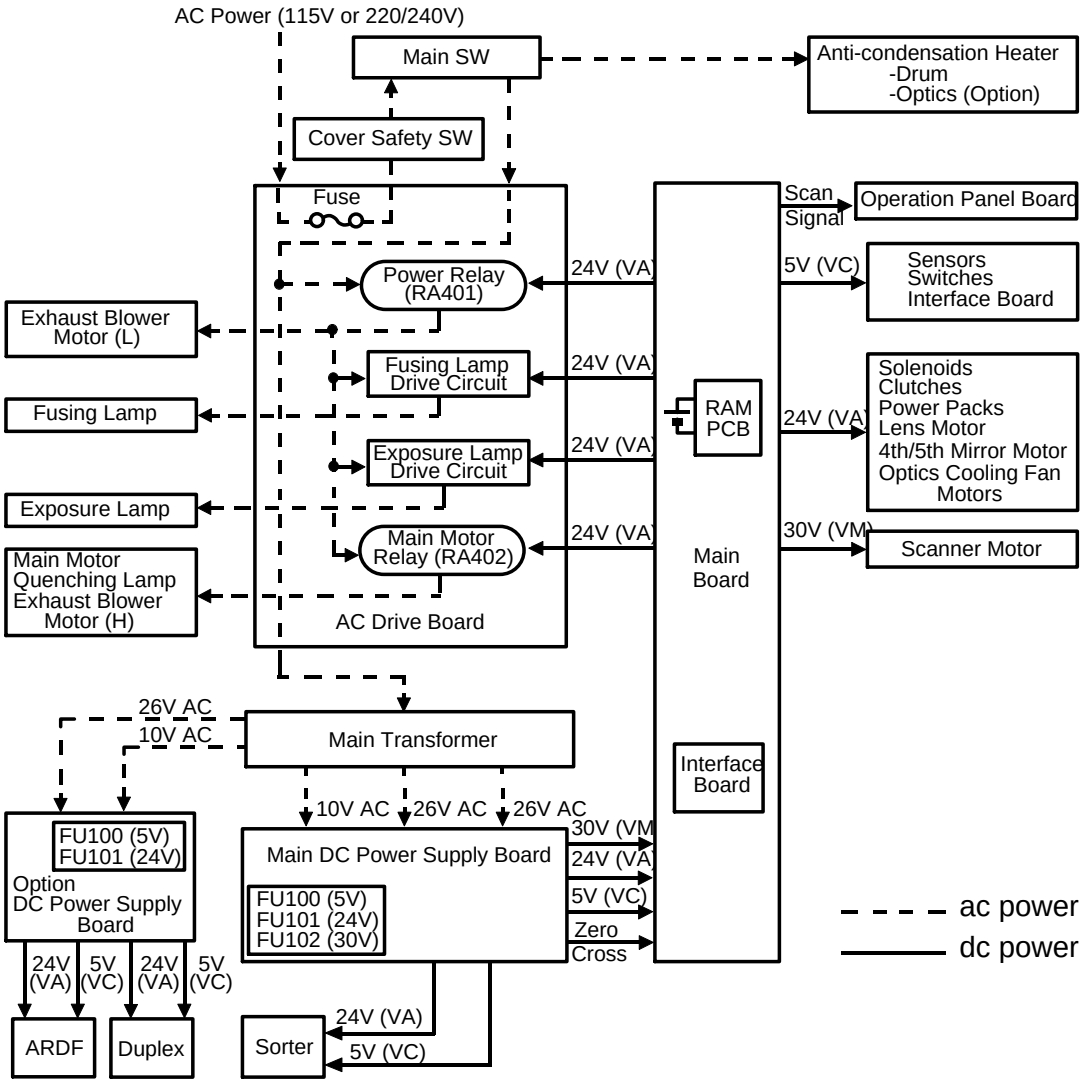
SYMBOL	NAME	FUNCTION	INDEX NO.
Others			
TH	Fusing Thermistor	Monitors the fusing temperature.	31
TF	Fusing Thermofuse	Provides back-up overheat protection in the fusing unit.	32
TS	Optics Thermoswitch	Provides back-up overheat protection around the exposure lamp.	42
C	Main Motor Capacitor	Start capacitor	66

8. OVERALL MACHINE CONTROL



The above diagram shows the control system of this copier in block form. The CPU (IC123) on the main board controls the timing of all copier's operation based on the CPU's internal clock. The CPU monitors the input signals from all sensors and controls the dc components directly or through two I/O chips (IC 105 and IC 124). It also controls ac components such as the fusing lamp, exposure lamp, main motor quenching lamp, and exhaust blower motor (High speed) directly via the ac drive board. The exhaust blower motor (Low speed) is controlled via the I/O chip (IC 124) and ac drive board. The charge corona, grid voltage and development bias are powered by the same power pack (P1) but are controlled separately as shown above. The main board has a RAM board for the service program mode and misfeed recovery. A battery backs up the power to the RAM board.

9. AC POWER AND DC POWER DISTRIBUTION



When this copier is plugged in and the main switch is turned off, ac power is supplied via the ac drive board to the anti-condensation heater. When the front cover and/or the exit cover is open, the cover safety switch completely cuts off power to all ac and dc components. The RAM board has a back up power supply (dc battery) for the service program mode and misfeed job recovery.

When the main switch is turned on, the ac power supply to the anti-condensation heater is cut off and ac power is supplied to the ac drive board. The main transformer receives wall outlet ac power through the ac drive board and outputs 10 volts ac and 26 volts ac to the main dc power supply board and the option dc power supply board.

The main dc power supply board converts the 10 volts ac input to +5 volts and a zero cross signal. There are two 26 volts ac inputs. The dc power supply board converts them to +24 volts and +30 volts.

The +5 volts and +24 volts are supplied to both the copier main board and the sorter main board. The zero cross signal and +30 volts are supplied to the copier main board.

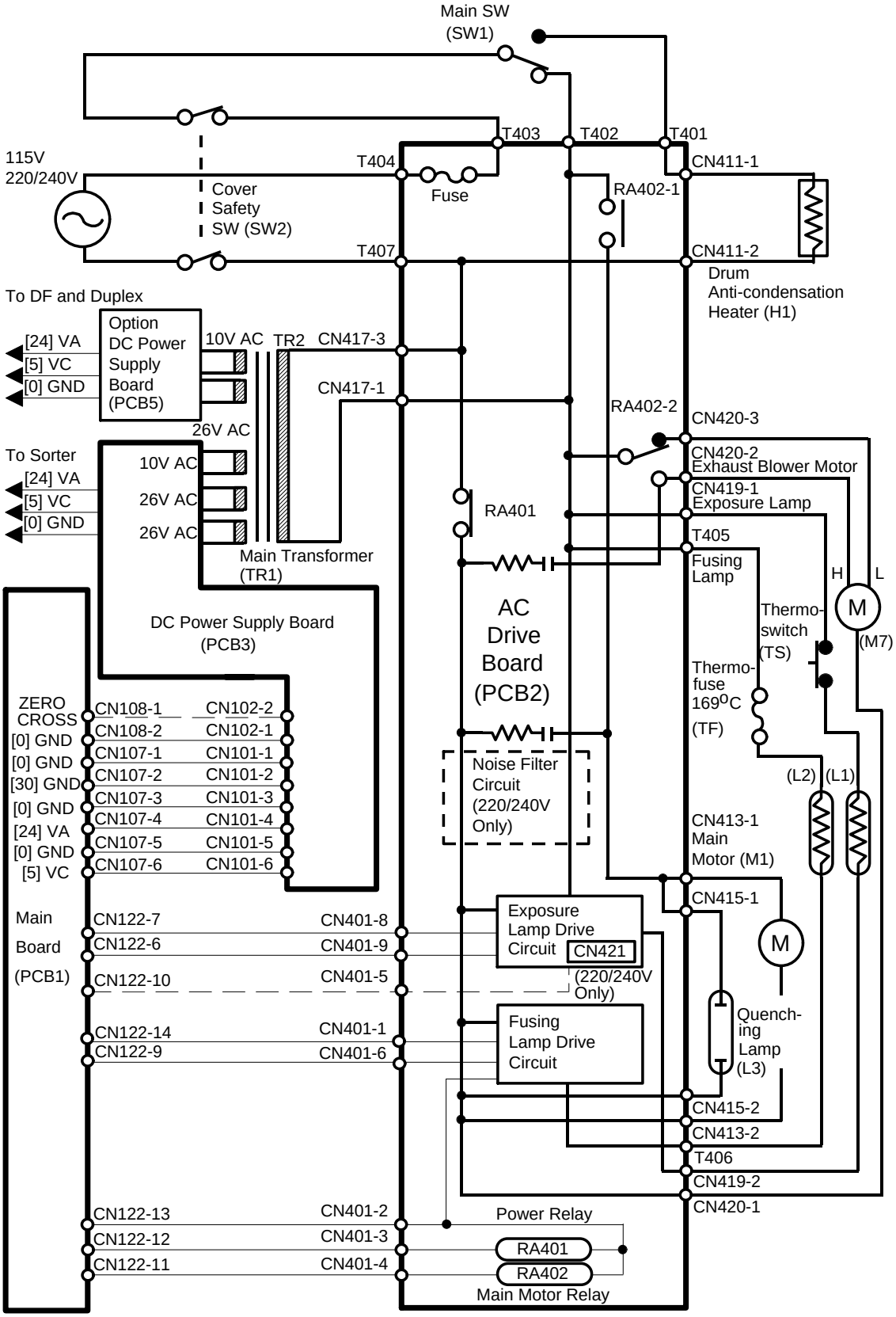
The copier main board supplies dc powers to all copier dc components. All sensors, and switches plus the interface board operate on +5 volts. The scanner motor operates on +30 volts. All other dc components including the power relay (RA401) and the main motor relay (RA402) operate on +24 volts. The ARDF and the duplex unit have a separate dc power supply.

When the main board receives power, it activates the power relay (RA401) which then supplies ac power to the fusing lamp drive circuit, and the exposure lamp drive circuit on the ac drive board. The exhaust blower motor begins rotating at low speed. The fusing lamp drive circuit receives a trigger signal from the main board and the fusing lamp lights. The exposure lamp does not turn on until the main board send a trigger pulse to the exposure lamp drive circuit.

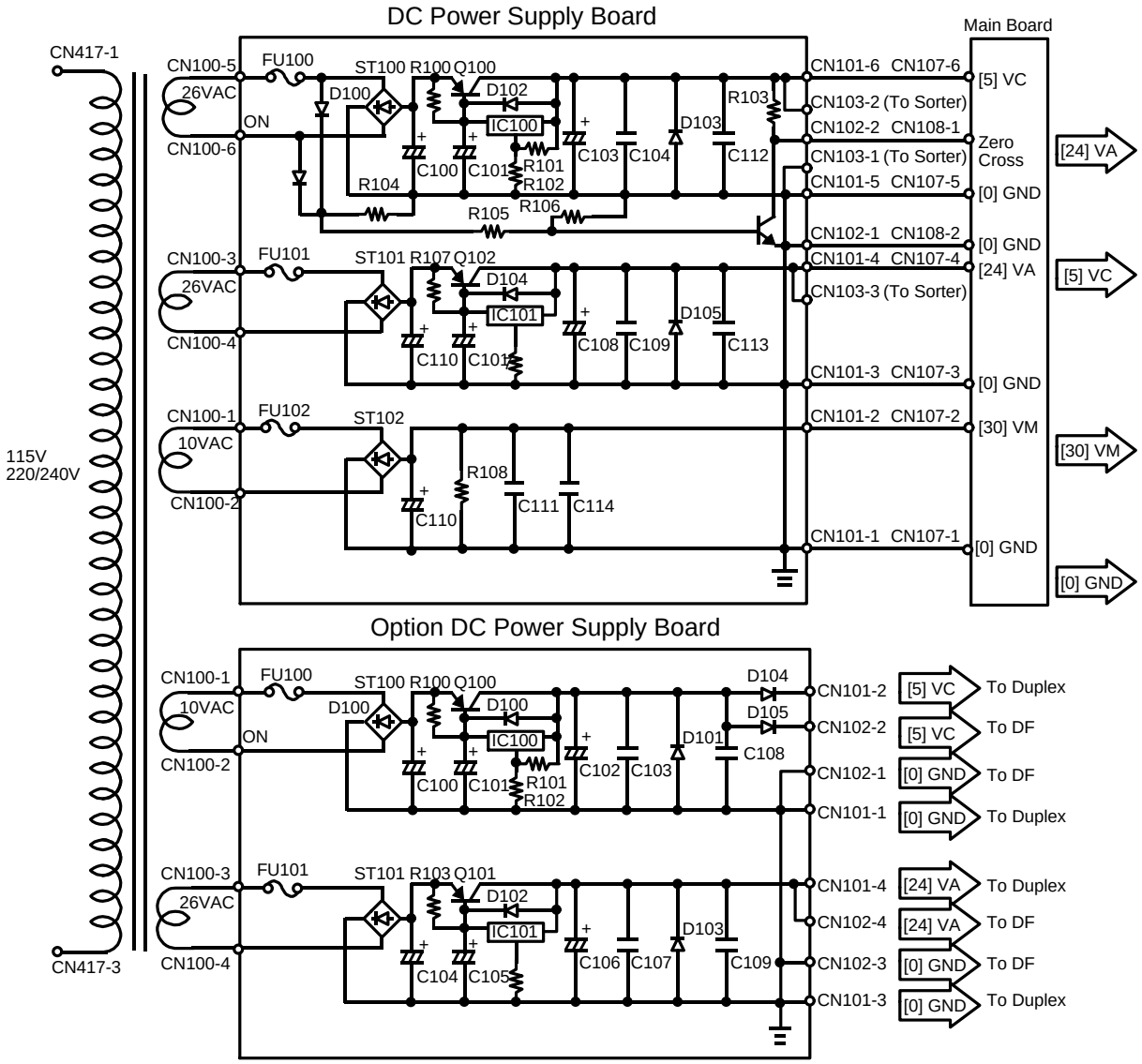
When the Start key is pressed, the main board energizes the main motor relay (RA402). Then, the main motor and the quenching lamp turn on and the exhaust blower starts rotating at high speed.

When the main switch is turned off, power is cut off to the main board and to RA401, and the drum and optional anticondensation heaters are turned on. The exposure lamp and the fusing lamp power lines are completely disconnected from the line voltage.

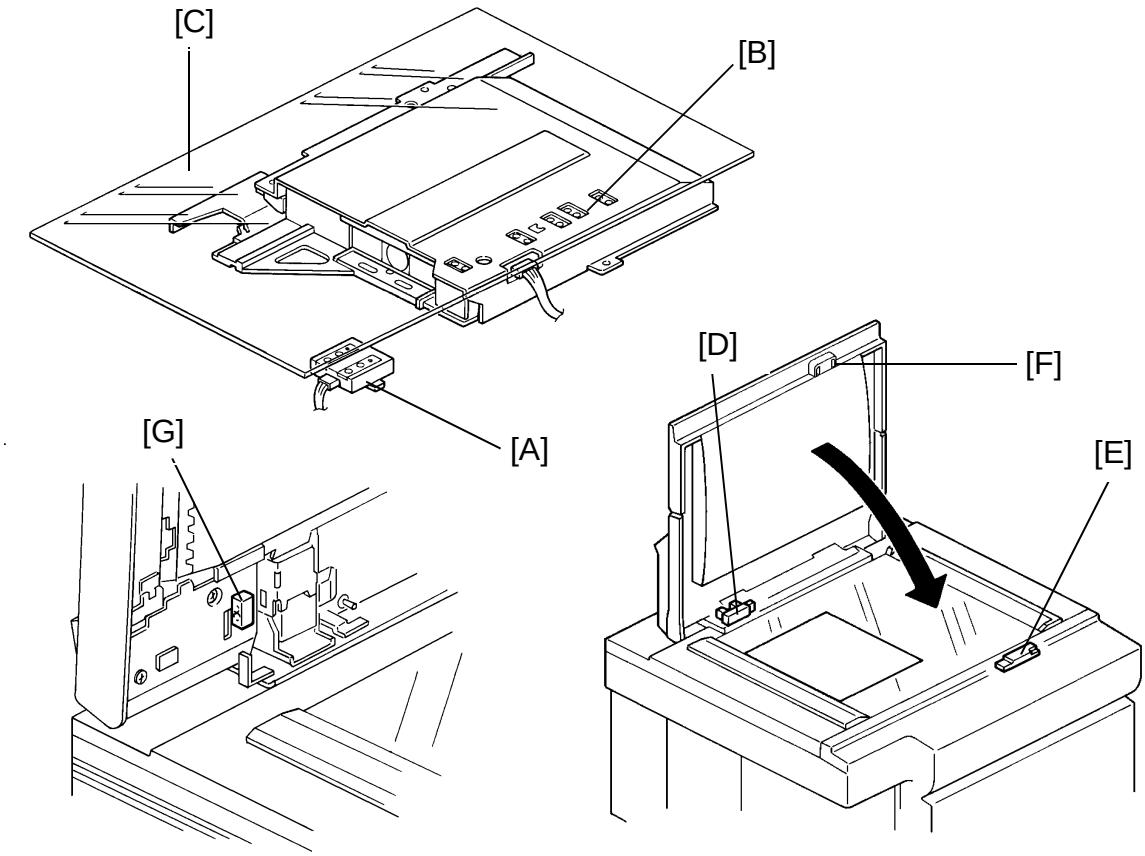
9.1 AC POWER DISTRIBUTION



9.2 DC POWER DISTRIBUTION



10. ORIGINAL SIZE DETECTION IN PLATEN MODE



An original width sensor [A] and an original length sensor [B] are under the exposure glass [C]. The original width sensor consists of two reflective photosensors. The original length sensor consists of four reflective photosensors.

While the main switch is on, these sensors are active and the CPU receives their output signals through the interface board. The CPU checks the output signals twice as the platen cover (document feeder) is being closed.

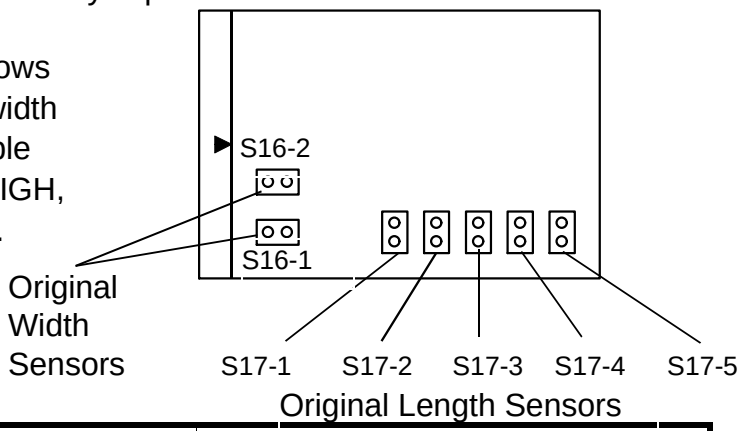
The first check is done when the platen cover position sensor [D] turns on. (When the document feeder is installed, the first check is done when the DF position sensor [G] on the document feeder turns on.) The platen cover position sensor is actuated when the platen cover (document feeder) is lowered to about 10 cm (4") above the exposure glass. At this time only the sensors located underneath the original receive the reflected light. These sensors output LOW signals.

The second check is done when the platen cover closed switch [E] turns on. This is when the platen cover (document feeder) is completely closed. The platen cover closed switch is a lead switch. A magnet [F] mounted on the platen cover (document feeder) actuates the lead switch.

The second check is necessary to confirm that the original size detected at the first check is correct. At the second check, all sensors should output LOW signals because the platen cover sheet (document feeder belt) is white. This double check prevents original size detection errors that may occur if a black solid area on the original is positioned directly over a sensor.

When a copy with the platen cover (document feeder) open, the CPU checks the original size when the Print key is pressed.

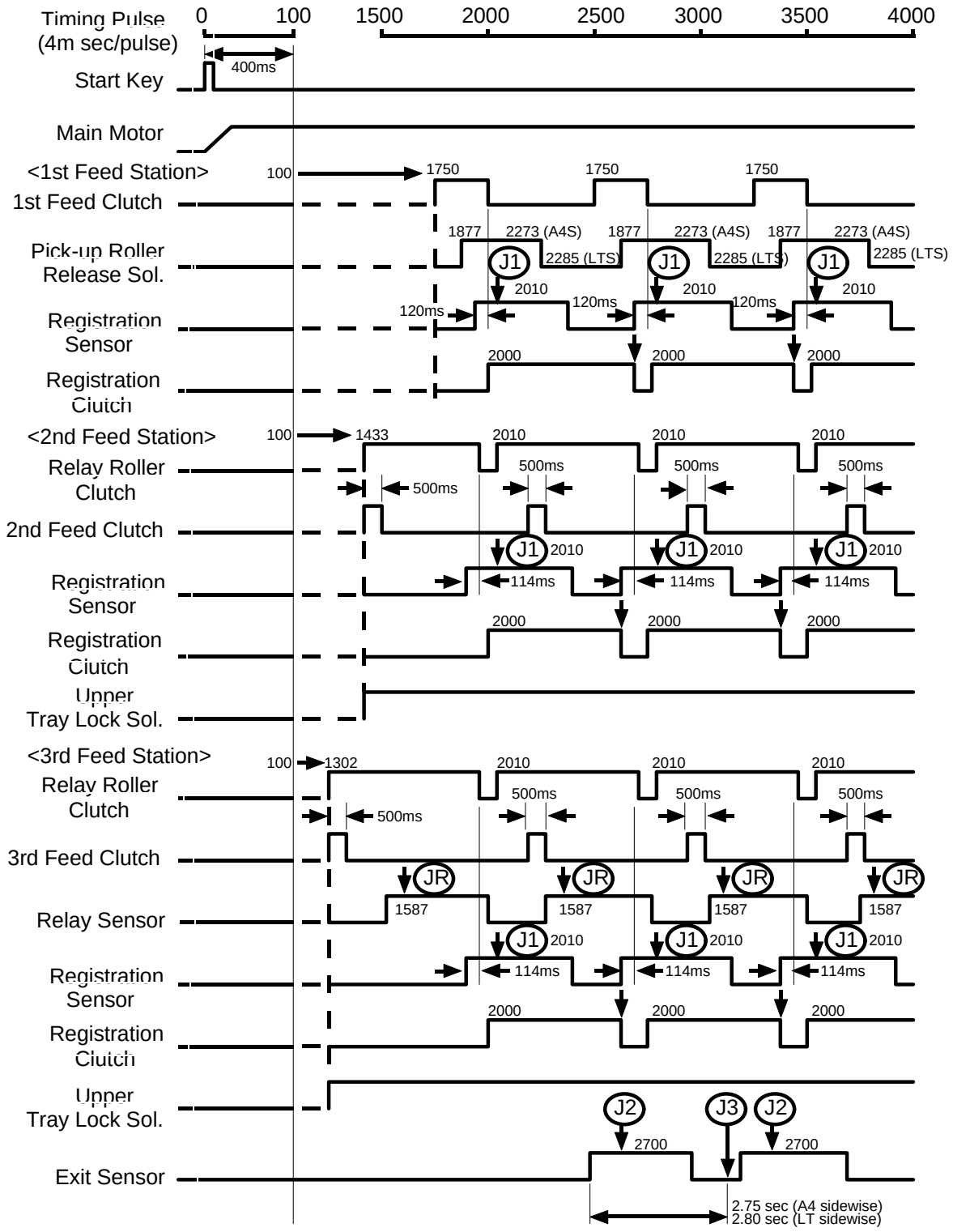
The following illustration shows the location of the original width and length sensors. The table shows the sensor output (HIGH, LOW) for each original size.



Sensors / Original Size		Original Width Sensor		Original Length Sensor				
		S16-1	S16-2	S17-1	S17-2	S17-3	S17-4	S17-5
A3	11" x 17"	0	0	0	0	0	0	0
B4	11" x 15" 10" x 14"	0	0	0	0	0	0	1
—	8 1/2" x 14"	1	0	0	0	0	0	1
A4 lengthwise	8 1/2" x 11"	1	0	0	0	1	1	1
B5 lengthwise or smaller	8" x 10"	1	0	0	1	1	1	1
A5 lengthwise	5 1/2" x 8 1/2" or smaller	1	1	1	1	1	1	1
A4 lengthwise or smaller	11" x 8 1/2"	0	0	0	1	1	1	1
B5 sideways	8 1/2" x 5 1/2"	0	0	1	1	1	1	1
A5 sideways or smaller	8 1/2" x 5 1/2" or smaller	1	0	1	1	1	1	1

0: LOW 1: HIGH

11. PAPER FEED AND MISFEED DETECTION TIMING



The registration sensor, the exit sensor and the relay sensor monitor the movement of the paper through the paper path. If the CPU determines that a misfeed exists, the Check Paper Path and the Misfeed Location indicators turn on. When the main switch is turned on, the CPU checks these three sensors for initial misfeed. During the copy cycle, the CPU performs three kinds of misfeed detection:

J1: Checks whether the registration sensor is actuated within 10 pulses (40 milliseconds) after the registration clutch turns on. (The Misfeed Location indicator "A" or "B" turns on.)

J2: Checks whether the exit sensor is actuated within 700 pulses (2.8 seconds) after the registration clutch turns on. (The Misfeed Location indicator "C" turns on.)

J3: Checks whether the copy paper has passed through the exit sensor 2.75 (A4 sideways) or 2.80 (Letter sideways) seconds after the exit sensor has been actuated. (The Misfeed Location indicator "D" turns on.)

JR: Checks whether the relay sensor is actuated within 285 pulses (1.14 seconds) after the 3rd feed clutch turns on. (The Misfeed Location indicator "A" turns on.)

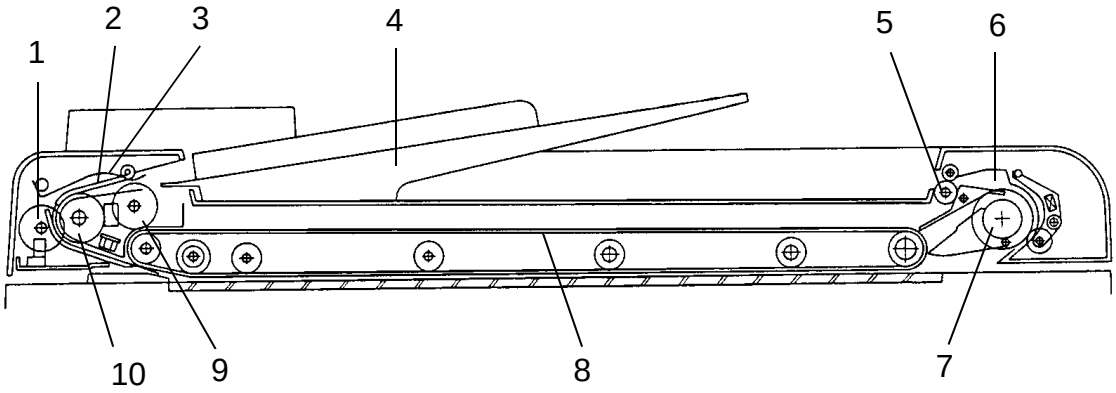
12. DOCUMENT FEEDER (Machine Code: A318)

12.1 SPECIFICATIONS

Original Size and Weight:	— Thin original mode —	
	Maximum	A3 / 11" x 17"
	Minimum	B6 / 5 1/2" x 8 1/2"
	Weight	41 to 128 g/m^2 (11 to 34 lb)
	— Thick original mode —	
	Maximum	A3 / 11" x 17"
	Minimum	B6 / 5 1/2" x 8 1/2"
	Weight	52 to 128 g/m^2 (14 to 34 lb)
	— Auto reverse mode —	
	Maximum	A3 / 11" x 17"
	Minimum	B6 lengthwise / 5 1/2" x 8 1/2" lengthwise
	Weight	64 to 105 g/m^2 (17 to 28 lb)
Original Feed:	Automatic feed — ADF mode Manual feed one by one — SADF mode	
Original Table Capacity:	30 sheets / 80 g/m^2 (20 lb)	
Original Set:	Face up. First sheet on top	
Original Transport:	One flat belt	
Copy Speed:	16 copies/minute for A4 / 8 1/2" x 11" sideways (A048 copier) 20 copies/minute for A4 / 8 1/2" x 11" sideways (A054 copier)	
Power Consumption:	20 W	
Dimensions (W x D x H):	670 x 460 x 103 mm (26.4" x 18.1" x 4.1")	
Weight:	Approximately 8.8 kg (19.4 lb)	

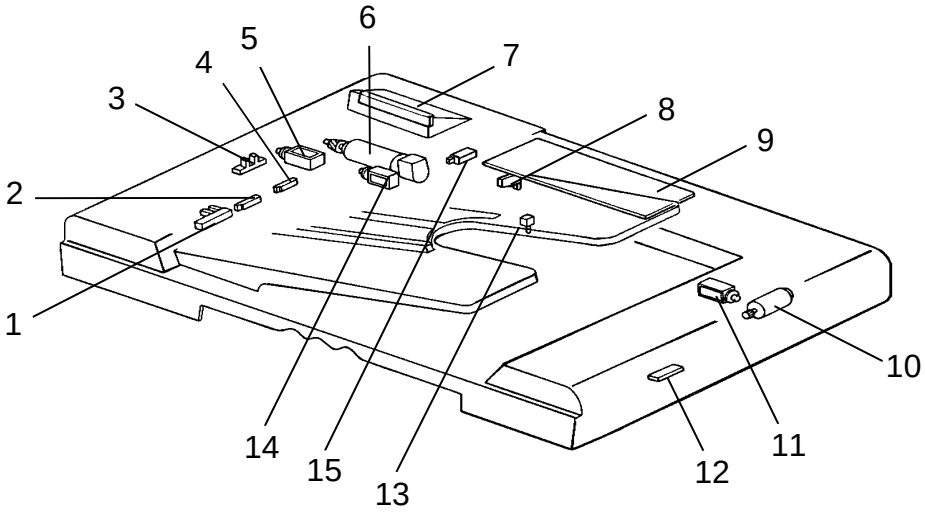
12.2 COMPONENT LAYOUT

- Mechanical Components -



1. Pulse Generator Disk
2. Friction Belt
3. Pick-up Lever
4. Original Table
5. Exit Roller
6. Inverter Pawl
7. Inverter Roller
8. Transport Belt
9. Pick-up Roller
10. Feed Roller

- Electrical Components -

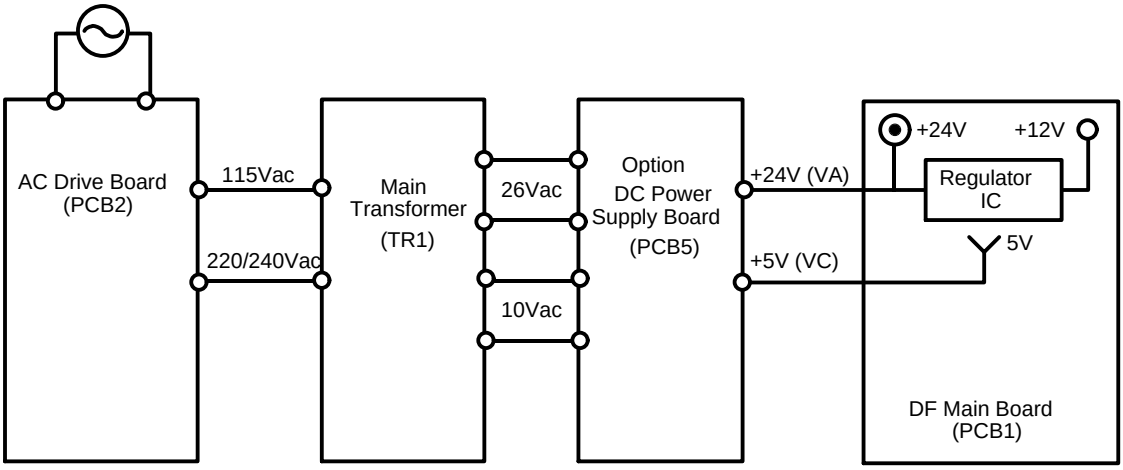


1. Original Set Sensor
2. Registration Sensor
3. Pulse Generator Sensor
4. Original Width Sensor
5. Pick-up Solenoid
6. Belt Drive Motor
7. Indicator Panel
8. Lift Switch
9. DF Main Board
10. Feed-out Motor
11. Inverter Solenoid
12. Feed-out Sensor
13. Original Select Switch
14. Feed-in Solenoid
15. DF Position Sensor

12.3 ELECTRICAL COMPONENT DESCRIPTIONS

Symbol	Name	Function	Location
Motors			
M1	Belt Drive Motor	DC servomotor that drives to the transport belt and feed-in system (pick-up roller, feed roller, pull-out roller and relay roller).	6
M2	Feed-out Motor	DC servomotor that drives the feed-out unit of the DF.	10
Solenoids			
SOL1	Pick-up Solenoid	Energizes to press the pick-up lever against the stack of originals in preparation for original feed-in.	5
SOL2	Feed-in Solenoid	Turns on to engage the feed-in clutch so rotation is transmitted to the feed roller, pull-out rollers, and relay rollers.	14
SOL3	Inverter Solenoid	Energizes to invert the original when copying two sided originals.	11
Switches			
SW1	Lift Switch	Informs the CPU when the DF is lifted and also serves as the jam reset switch for the DF.	8
SW2	Original Select Switch	Selects thick original mode or thin original mode.	13
Sensors			
S1	Original Set Sensor	Informs copier CPU that originals have been placed and causes the Insert Original indicator to go out.	1
S2	Registration Sensor	Sets original stop timing and measures original length.	2
S3	Original Width Sensor	Determines the width of the originals.	4
S4	Pulse Generator Sensor	Generates pulses used to measure the original length.	3
S5	Feed-out Sensor	Checks for original misfeeds and sets original stop timing when in auto reverse mode.	12
S6	DF Position Sensor	Detects when the document feeder is positioned about 10 cm above exposure glass.	15
Printed Circuit Boards			
PCB1	DF Main Board	Controls all DF functions.	9
PCB2	Indicator Panel Board	Contains operator indicators.	7

12.4 POWER DISTRIBUTION

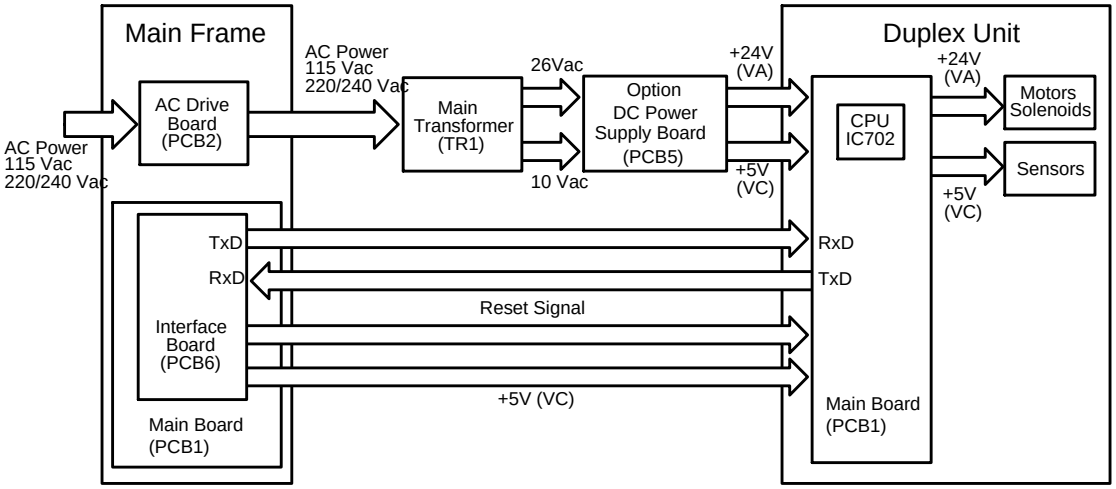


The DF uses three DC power levels: +24 volts, +12 volts, and +5 volts.

When the main switch is turned on, the main transformer receives the wall outlet ac power through the ac drive board and outputs 10 volts ac and 26 volts ac to the option dc power supply board. The option dc power supply board then converts the 10 volts ac input to +5 volts dc and the 26 volts ac input to +24 volts. Then, thoes two dc voltsges are supplied to the DF main board.

The regulator IC on the DF main board further steps down the +24V to +12V.

13. DUPLEX UNIT POWER DISTRIBUTION AND OVERALL MACHINE CONTROL



When the main switch is turned on, the main transformer receives wall outlet ac power through the ac drive board and outputs 10 volts ac and 26 volts ac to the option dc power supply board. The option dc power supply board then converts the 10 volts ac input to +5 volts and the 26 volts ac input to +24 volts. Then, the +5 volts and +24 volts are supplied to the duplex unit main board. The interface board also provides +5 volts to the duplex unit main board and sends a reset signal to initialize the duplex unit CPU.

The duplex unit main board supplies dc power to all electrical components in the duplex unit. All motors and solenoid operate on +24 volts and all sensors operate on +5 volts.

The duplex unit has its own CPU which controls all functions in the duplex unit. The duplex unit CPU communicates with the copier through the interface board using a serial interface.

14. INSTALLATION

14.1 INSTALLATION REQUIREMENTS

14.1.1 Environment

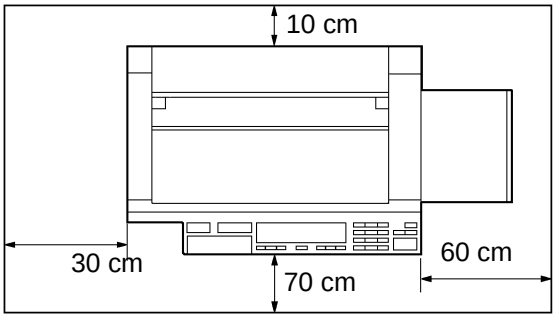
1. Temperature Range: 10^{o}C to 30^{o}C (50^{o}F to 86^{o}F)
2. Humidity Range: 15% to 90% RH
3. Ambient Illumination: Less than 1,500 lux. (Do not expose to direct sunlight.)
4. Ventilation: Room of more than 30 m^3. Room air should turn over at least 3 times/hour.
5. Ambient Dust: Less than 0.15 mg/m^3 (4 x 10^{-3} oz/yd^3)
6. The machine must not be subjected to sudden temperature changes. Do not install the machine where it will be directly exposed to cool air from an air conditioner or hot air from a heater.
7. Avoid placing the machine in an area filled with corrosive gas.
8. Do not install at any location over 2,000 meters (6,500 feet) above sea level.
9. Place the machine on a strong and level base.
10. Avoid any area where the machine may be subjected to frequent, strong vibrations.

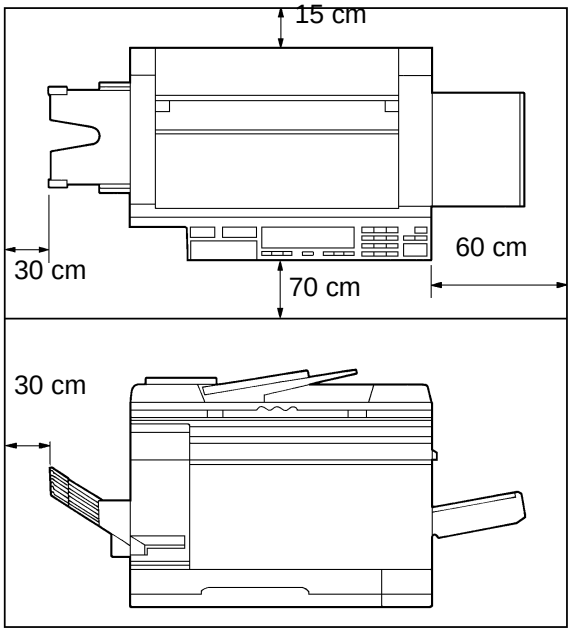
14.1.2 Machine Level

1. Front to back: Within 5 mm (0.2") of level
2. Right to left: Within 5 mm (0.2") of level

Make sure that the machine is level using a carpenter's level.

14.1.3 Minimum Space Requirements





1. Front : 70 cm (27.6")
2. Back : 10 cm (3.9")
   : 15 cm (6.0") (when the sorter is installed.)
3. Right : 60 cm (31.5")
4. Left : 30 cm (11.8")

NOTE: Make sure there is at least 15 cm (6.0") clearance behind the copier so that the sorter will not be damaged when it is opened.

14.1.4 Power Requirements

1. Input voltage level:

   110V/60Hz : More than 15A (for Taiwan)
   115V/60Hz : More than 15A (for N.A.)
   220V/50Hz : More than 8A (for EU.)
   220V/60Hz : More than 8A (for EU.)
   240V/50Hz : More than 8A (for EU.)

2. Permissible voltage fluctuation: ±10%

3. Do not set anything on the power cord.

NOTE: a) Be sure to ground the machine. (Do not connect the grounding wire to a gas pipe.)

b) Make sure the plug is firmly inserted in the outlet.

c) Avoid multiwiring.

14.2 INSTALLATION PROCEDURE

14.2.1 Introduction

This section covers only those parts of the copier and option installation procedures that differ from the A048.

The following table shows which options can be used on the A048 and A054 copiers:

	A048 Copier	A054 Copier
Document Feeder	(A465) (A318)	(A318) **NOTE (1)**
Sorter	(A490)	(A490)
Duplex Unit	(A491)	(A491) **NOTE (2)**
Color Development Unit	(A313)	(A313)
DC Power Supply Unit	(A494)	**NOTE (3)**

( ) : Product Code

NOTE: (1) The A465 DF can be installed on the A054 copier; however, the A465 DF does not have a DF positioning sensor, so APS mode will not function in platen mode.

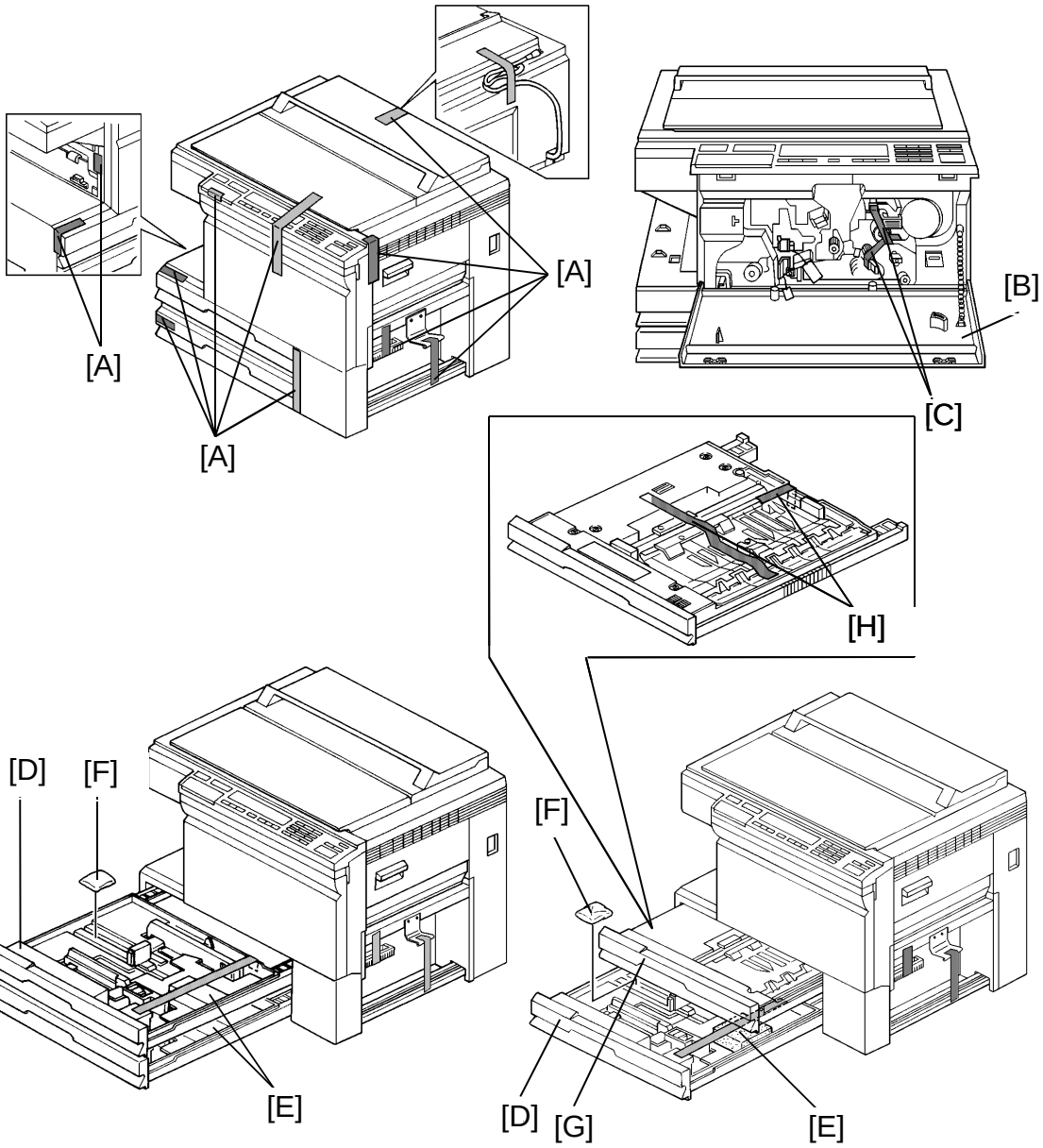
(2) A054 copiers with the destination codes A054-26, -27 -46, and -47 are equipped with a duplex unit as a standard feature.

(3) The dc power supply unit for the document feeder and duplex unit and the interface board are already installed on the A054 copier at the factory. The optional dc power supply unit (Unit code #A494) is not required.

(4) The installation procedures of the following options are the same as those of the A048 copier. Refer to each section of the A048 copier as follows:

1. Key Counter Holder — Refer to page 3-12.
2. Optics Anti-condensation Heater — Refer to page 3-13.
3. Color Development Unit — Refer to page 3-14 to16.

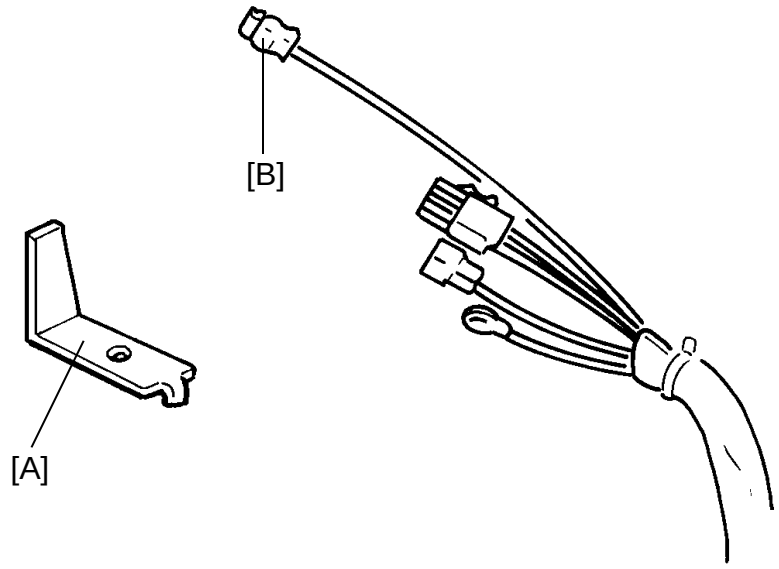
14.2.2 Copier Installation



1. Remove 11 strips of tape [A] from the copier.
2. Open the front cover [B], and remove 2 strips of tape [C].
3. Pull out the paper tray [D] and remove the foam blocks [E] (strips of tape) and the silica gel [F]. On machines equipped with the duplex unit [G], pull out the duplex unit and remove the 2 strips of tape [H].
4. Do **steps 5 to 21** of the A048 copier installation procedure (page 3-5 to 9).
   - See page 3-10 for the 220/240 conversion procedure.
   - See page 3-11 for the cassette modification procedure.

14.3 DOCUMENT FEEDER INSTALLATION

14.3.1 Accessory Check



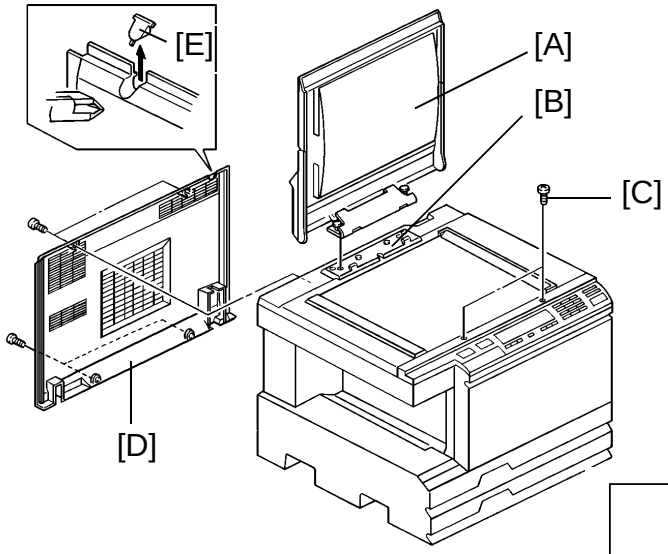
A DF position sensor actuator and a screw have been added as accessories for the APS function in platen mode, Also, a dc harness (connector [B]) for the APS function has been added to the DF harness assembly.
(When the A318 DF is installed on the A048 copier, the above accessories are not necessary and the connector [B] is not used.)

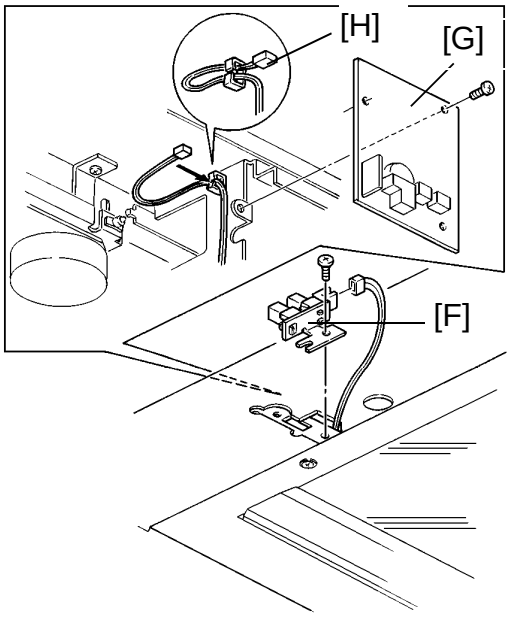
Check the quantity and condition of the accessories in the box according to the following list:

1. DF Position Sensor Actuator [A] . . . . . 1 pc
2. Philips Pan Head Screw With Washer - M3 x 5 . . . . . 1 pc

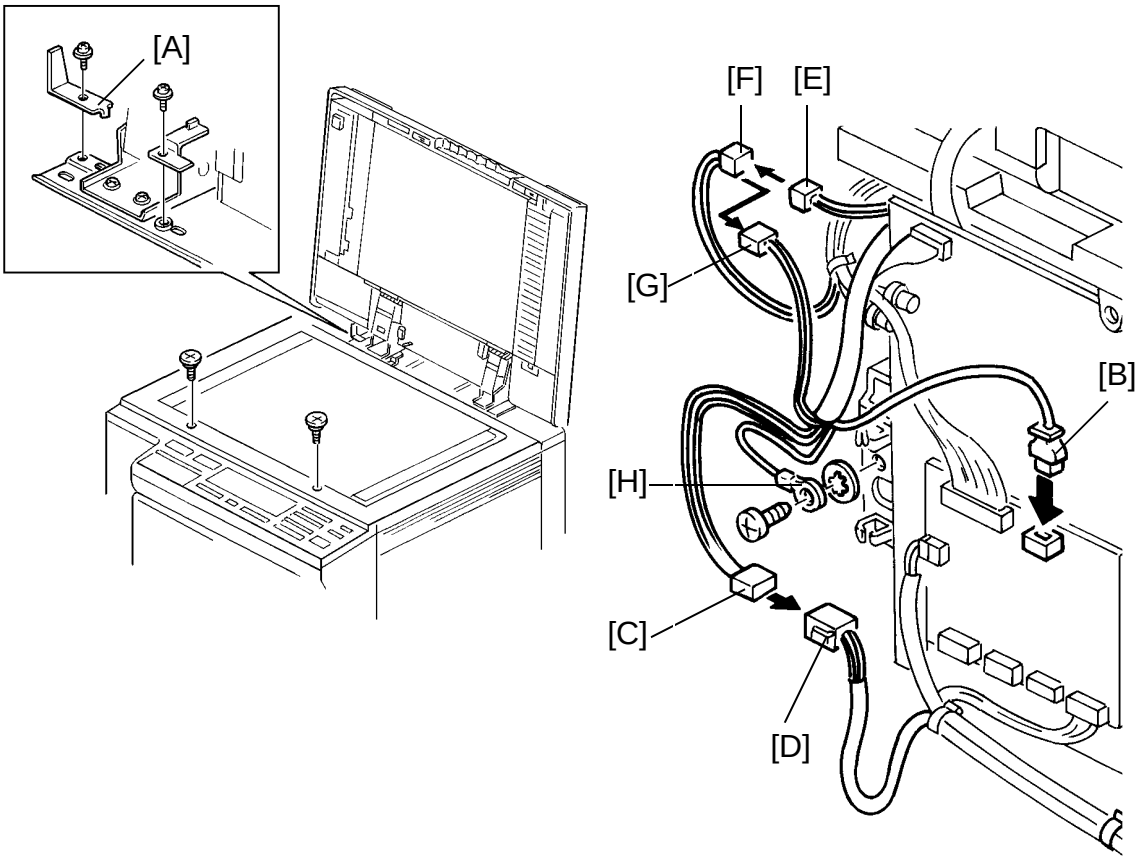
NOTE: For the other accessories, refer to the list on page 8-24.

14.3.2 Installation Procedure





1. Remove the following parts from the copier:
   1) Platen Cover [A] (2 push-locks)
   2) Platen Cover Pedestal [B] (4 screws)
   3) The 2 screws [C] securing the operation panel
   4) Rear Cover [D] (7 screws).
2. Remove the harness caps [E] on the rear cover with a pair of nippers.
3. Remove the platen cover position sensor [F] (1 screw).
4. Remove the CC/G/B power pack [G] (1 screw and 2 locking supports) and clamp the connector [H] as shown in the illustration; then, reinstall the CC/G/B power pack.



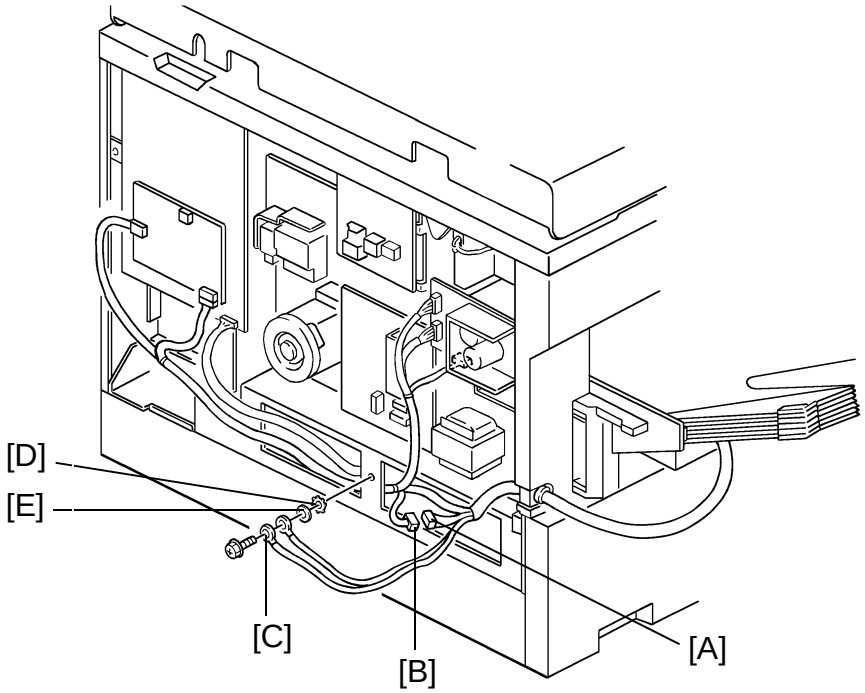
5. Do **steps 4 to 10** of the installation procedure for the A048 copier (page 8-26 to 27).
6. Install the DF position sensor actuator [A] (1 screw).
7. Do **steps 11 and 12** of the installation procedure for the A048 copier (page 8-27).
8. Connect the optics cable connector (2P/Black) [B] to CN206 on the interface board.
9. Connect the DC harness (4P/White) [C] to the harness connector [D].
10. Disconnect the platen cover position sensor connectors [E] [F], then connect connector [F] to the DF position sensor connector [G].

NOTE: If this procedure is not done, the APS mode will not function in platen mode.

11. Secure the grounding wire [H] to the right side plate.

12 Do **steps 16 to 25** of the installation procedure for the A048 copier (page 8-28 to 30).

14.4 SORTER INSTALLATION



NOTE: Refer to the list on page 9-12 to check the accessories.

1. Do **steps 1 to 11** of the installation procedure for the A048 copier (page 9-13 to 14).
2. Connect the sorter dc harness [A] (10P/Brown) to the harness connector [B].
3, Secure the grounding wire [C] (1 screw, toothed washer [D], and spring washer [E]) to the rear frame as shown.
4. Do **steps 15 to 19** of the installation procedure for the A048 copier (page 9-15).

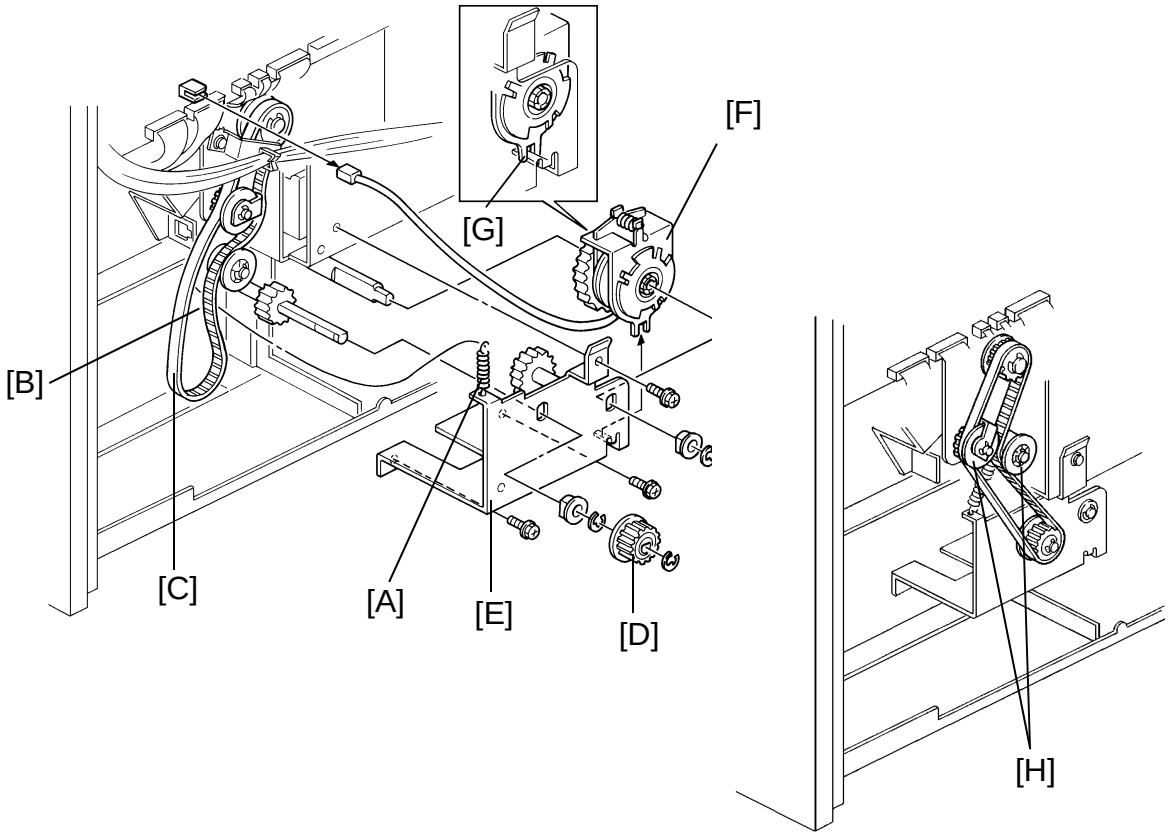
14.5 DUPLEX UNIT INSTALLATION

NOTE: Refer to the list on page 10-13 to check the accessories.

1. Follow the A048 duplex unit installation procedure (pages 10-13 to 10-18).

NOTE: **Steps 2, 13, 19, and 20** in the duplex unit installation procedure are not necessary with the A054 copier.

15. 3RD PAPER FEED CLUTCH SOLENOID REPLACEMENT



1. Turn off the main switch.
2. Remove the rear cover (7 screws).
3. Unhook the spring [A] from the tension pulley bracket [B].
4. Remove the drive belt [C] from the drive pulley [D]; then remove the pulley (1 E-ring).
5. Re move the 3rd paper feed clutch solenoid bracket [E] (2 E-rings and bushings and 3 screws).
6. Replace the 3rd paper feed clutch solenoid [F] (1 connector).

NOTE: 1. When the clutch solenoid is installed, make sure that the stopper [G] on the bracket fits into the slot on the clutch solenoid as shown.

2. When the drive belt is installed, make sure that the belt stoppers [H] of the drive pulleys are positioned correctly as shown. This is to prevent the drive belt from coming off the pulleys.

16. ELECTRICAL DATA

16.1 COPIER MAIN BOARD SCHEMATIC

16.2 OPERATION PANEL SCHEMATIC

16.3 AC DRIVE BOARD SCHEMATIC (220/240V)

16.4 AC DRIVE BOARD SCHEMATIC (115V)

16.5 INTERFACE BOARD SCHEMATIC

16.6 MAIN DC POWER SUPPLY BOARD SCHEMATIC

16.7 AUTO IMAGE DENSITY SENSOR BOARD SCHEMATIC

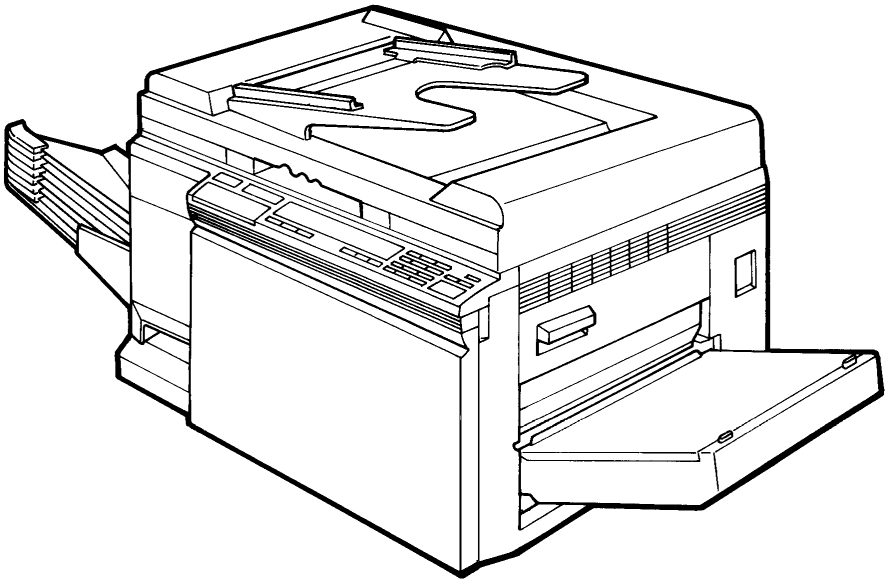
16.8 OPTIONAL DC POWER SUPPLY BOARD SCHEMATIC

16.9 COPIER TIMING CHART (LT)

16.10 COPIER TIMING CHART (A4)

SECTION 12

FT4415
SERVICE MANUAL



In this section, the FT4418 is referred to as the A048 copier, the FT4421 is referred to as the A054 copier, and the FT4415 is referred to as the A075 copier.

1. SPECIFICATIONS

Configuration:	Desk top
Copy Process:	Dry electrostatic transfer system
Originals:	Sheet/Book
Original Size:	Maximum A3/11"x17"
Copy Paper Size:	Maximum A3/11"x17" Minimum A6/5 1/2" x 8 1/2" (lengthwise)
Copy Paper Weight:	Cassette feed: 52 to 157 g/m^2 (14 to 42 lb) Manual feed: 52 to 157 g/m^2 (14 to 42 lb)
Reproduction Ratio:	2 Enlargement and 3 Reduction

	A4/A3 Version	LT/LDG Version
Enlargement	141% 122%	155% 129%
Full size	100%	100%
Reduction	93% 82% 71%	93% 74% 65%

Zoom:	From 50% to 200% in 1% steps
Copying Speed:	15 copies/minute (A4/8 1/2" x 11" sideways) 10 copies/minute (A3/11" x 17")
Warm-Up Time:	60 seconds (at 20°C)
First Copy Time:	5.9 seconds (A4/8 1/2" x 11" sideways)
Copy Number Input:	Ten keys, 1 to 99 (count up)
Manual Image Density Selection:	7 steps
Automatic Reset:	1 minute standard setting; can also be set to 3 minutes or no auto reset.
Paper Capacity:	Cassettes: 500 sheets (A4/8 1/2" x 11") 250 sheets (A3/11" x 17") Manual feed table: 50 sheets

Toner Replenishment: Black: Cartridge exchange (370g/cartridge)
Color (red, blue, & green): Cartridge exchange (310g/cartridge)

Copy Tray Capacity: 250 sheets (B4/8 1/2" x 14" and smaller)
100 sheets (A3/11" x 17")

Power Source: 110V/ 60Hz/ 15A (for Taiwan)
115V/ 60Hz/ 15A (for N.A.)
220V/ 50Hz/ 8A (for EU.)
220V/ 60Hz/ 8A (for EU.)
230V– 240V/ 50Hz/ 8A (for EU.)
(Refer to the serial number plate (rating plate) to determine the power source required by the machine.)

Power Consumption:

Maximum:	1.2 kw
Warm-up:	0.72 kw (average)
Ready:	0.16 kw (average)
Copy cycle:	0.83 kw (average)

Dimensions:

	Width	Depth	Height
Copier only	672 mm (26.5")	600 mm (23.7")	363 mm (14.3")
Full system	1149 mm (45.3")	600 mm (23.7")	466 mm (18.4")

Weight:

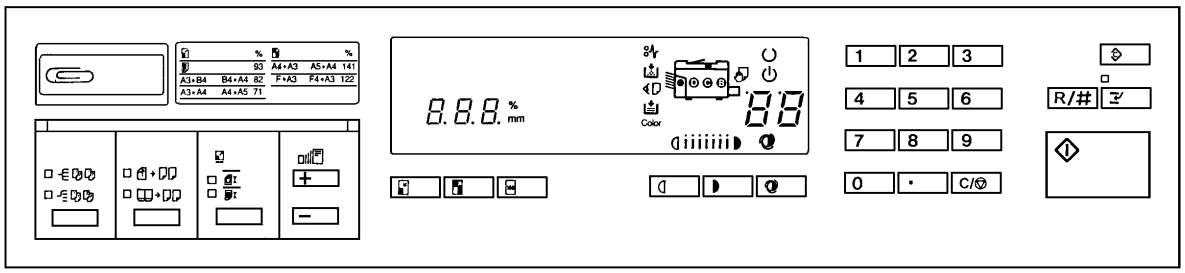
Copier only:	50 kg (110.3lb)
Full system:	67 kg (147.8lb)

Optional Equipment: Document feeder
10 bin sorter
Color development unit
Key counter
Universal cassette

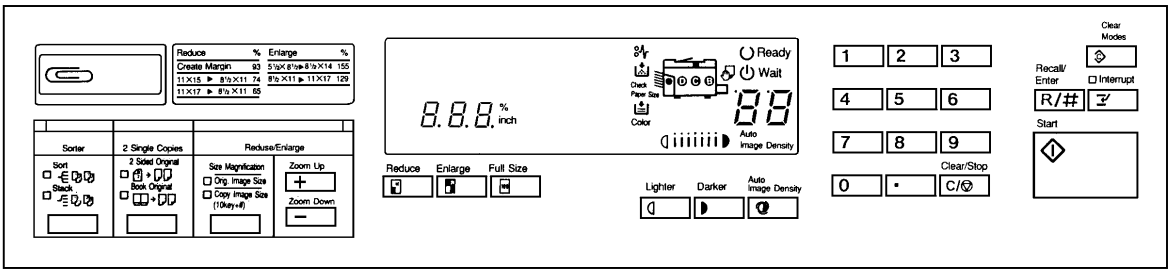
- Specifications are subject to change without notice.

2. OPERATION PANEL

— A4/A3 Version —



— LT/LDG Version —



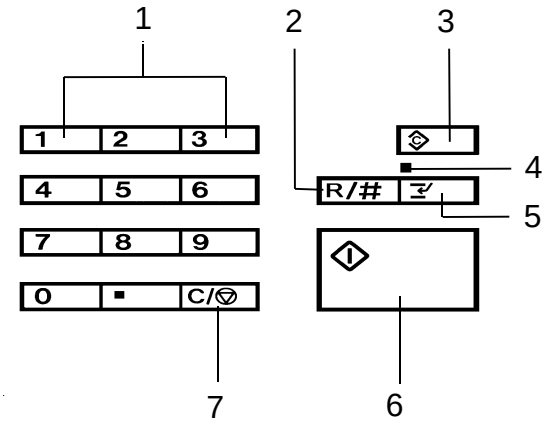
Section A: See page 12-4.

Section B: See page 12-5 or 12-6.

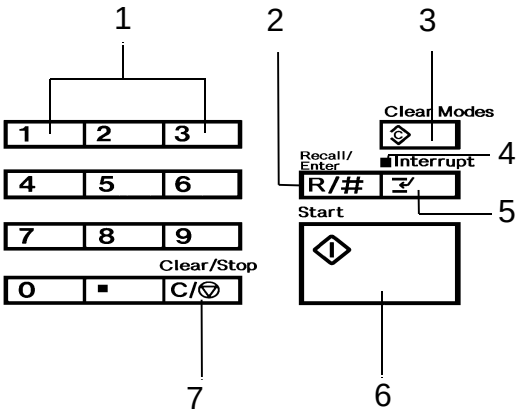
Section C: See page 12-7 or 12-8.

—Section A —

— A4/A3 Version —



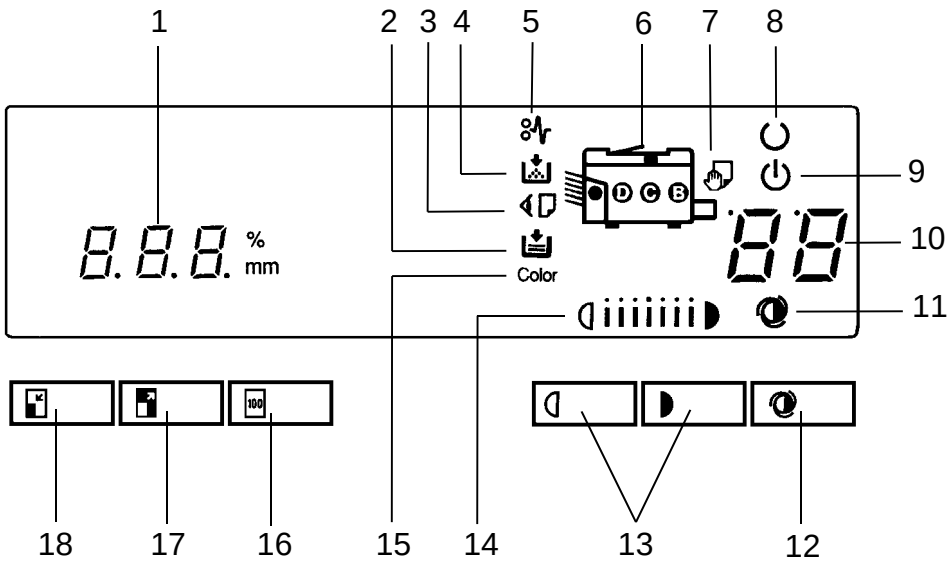
— LT/LDG Version —



1. **Number Keys**
   The number keys are used to enter the desired number of copies. They are also used to input the sizes of the original and the copy image when in size magnification mode.
2. **Recall/Enter Key**
   Press to display the number of copies entered. Also use to enter or change data when in size magnification mode.
3. **Clear Modes Key**
   Press to clear all previously entered settings and modes.
4. **Interrupt Indicator**
   Lights when interrupt mode is selected.
5. **Interrupt Key**
   Press to make interrupt copies during a copy run.
6. **Start Key**
   Press to start copying.
7. **Clear/Stop Key**
   Press to cancel the copy number entered. While copying, press to stop copying.

–Section B—

—A4/A3 Version—



1. Magnification Ratio Indicator
Shows the selected reproduction ratio and data for the Size Magnification mode.

2. Load Paper Indicator
Lights when the cassette runs out of paper.

3. Check Paper Size Indicator
Lights when improper paper size is selected in the book original mode. (copying is impossible.)

4. Add Toner Indicator
Blinks when it is time to change the toner cartridge. When it is continuously lit, the copier cannot be used until a new cartridge is installed.

5. Check Paper Path Indicator
Lights if there is a misfeed within the machine.

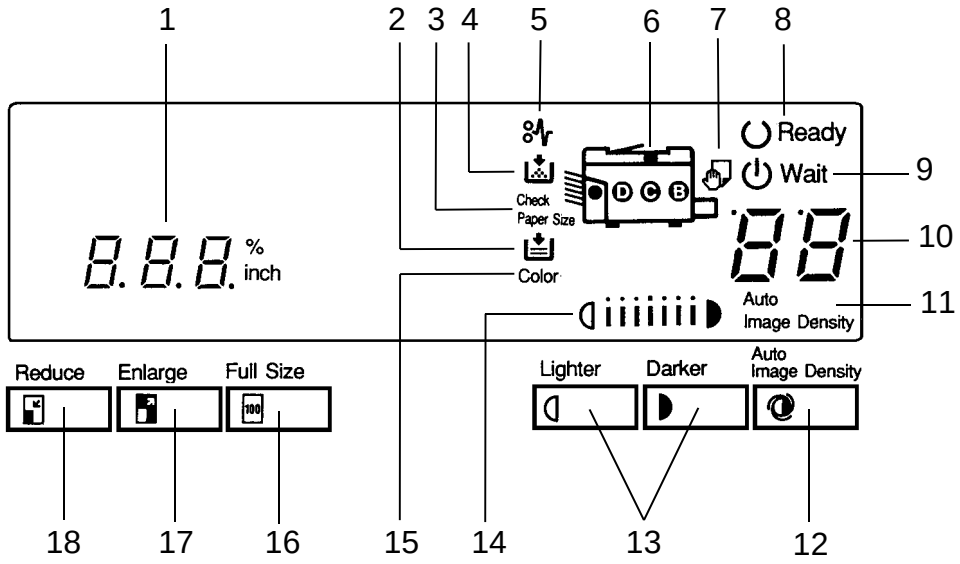
6. Misfeed Location Display
shows the location(s) of misfed paper.

7. Manual Feed Indicator
Lights when the manual feed table is open.

8. Ready Indicator
Lights when the machine is ready to make copies.

9. Wait Indicator
Lights when the machine is not ready to copy.

—LT/LDG Version—



10. Copy Counter
Displays the number of copies entered. While copying, it shows the number of copies made.

11. Auto Image Density Indicator
Lights when the copier is automatically controlling image density. If this indicator blinks, refer to page 44.

12. Auto Image Density Key
Press to select/cancel the automatic image density mode.

13. Manual Image Density Keys
Use to cancel the automatic image density mode and manually select the image density level.

14. Manual Image Density Indicator
Shows the manually selected image density. If this indicator blinks, refer to page 44.

15. Color Copy Indicator
Lights if a color toner development unit is installed.

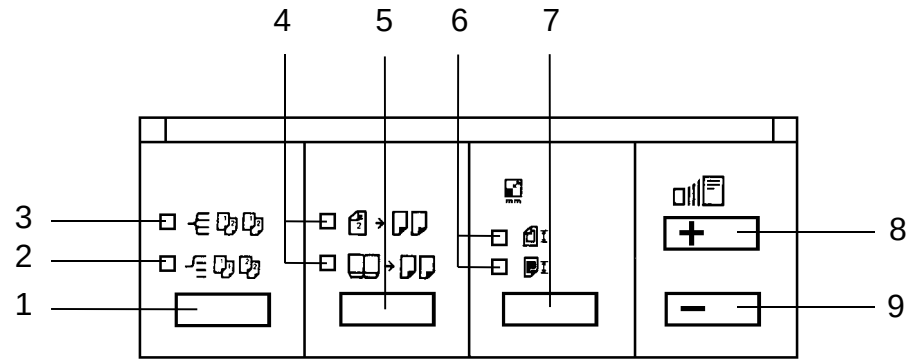
16. Full Size Key
Press to make copies the same size as the originals

17. Enlarge Key
Press to make enlarged copies.

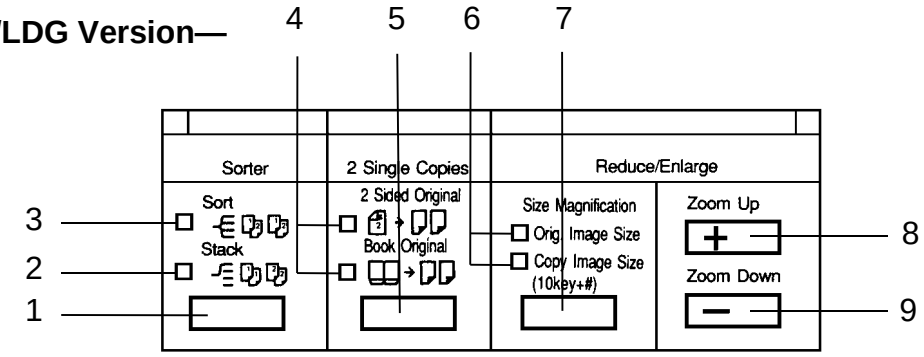
18. Reduce Key
Press to make reduced copies.

–Section C—

—A4/A3 Version—



—LT/LDG Version—



1. Sorter Key
Press to select the sort or stack mode. The sort mode and stack mode are optional features requiring a sorter.

2. Stack Indicator
Lights when in the stack mode.

3. Sort Indicator
Lights when in the sort mode.

4. 2 Single Copies Indicator
Show which the 2 single copies mode is selected.

5. 2 Single Copies Key
Press to select one of two 2 single copies modes. The 2 sided original mode is an optional feature requiring a document feeder.

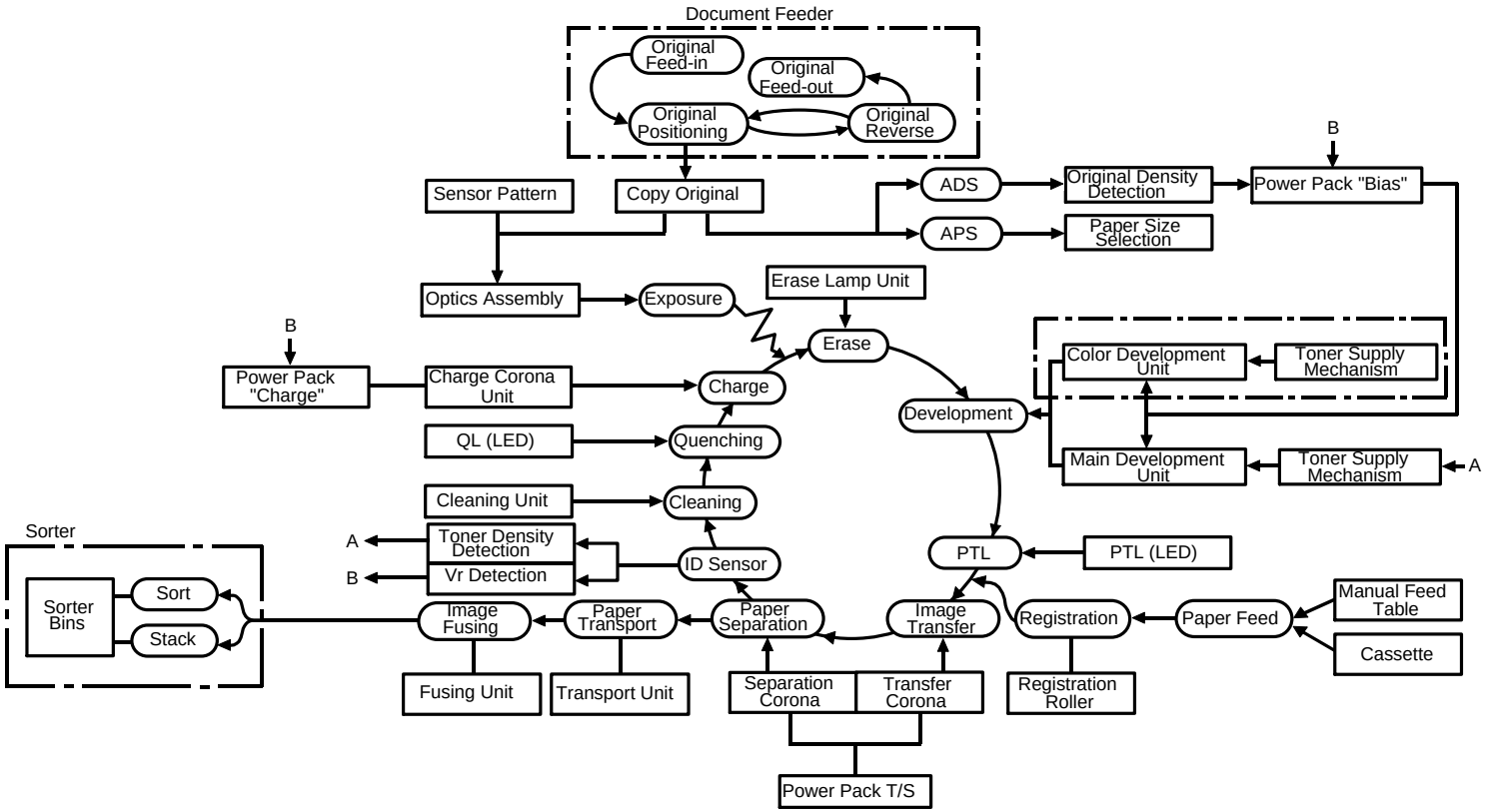
6. Size Magnification Indicators
Lights when in the size magnification mode; shows when to enter the original size and copy size data.

7. Size Magnification Key
Press to select the size magnification mode.

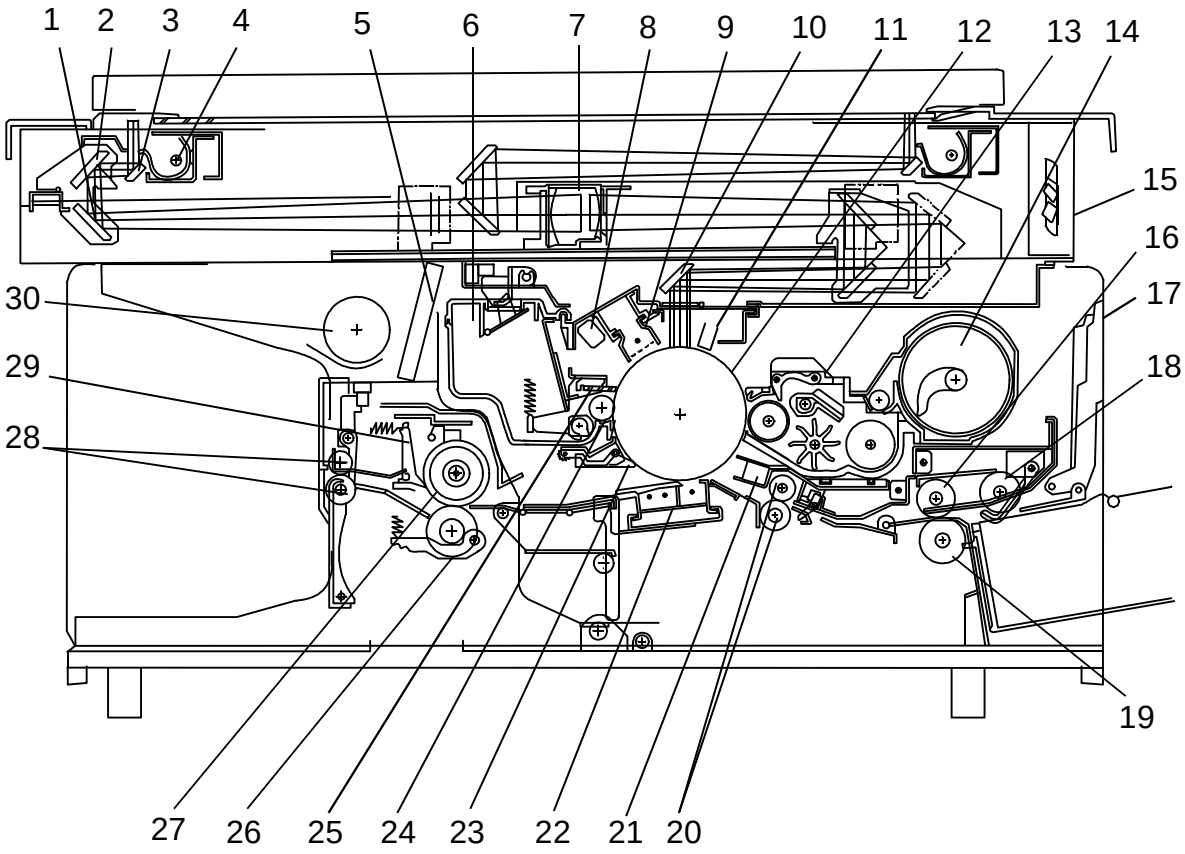
8. Zoom Up Key
Press to increase the reproduction ratio in 1% steps.

9. Zoom Down Key
Press to reduce the reproduction ratio in 1% steps.

3. FUNCTIONAL OPERATION

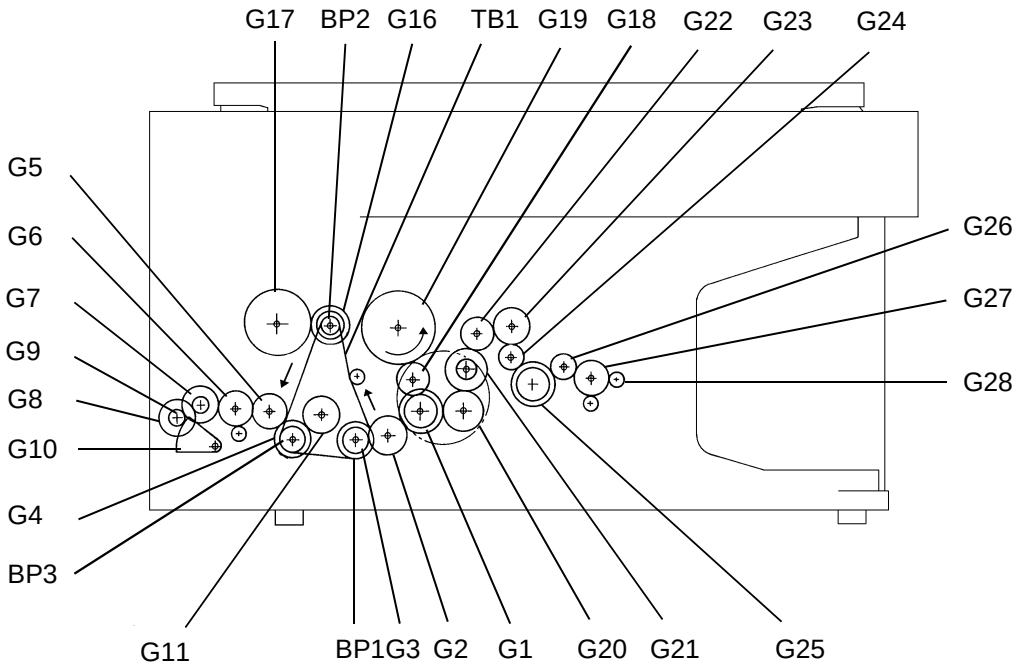

Document Feeder
Original Feed-in
Original Feed-out
Original Positioning
Original Reverse
Sensor Pattern
Copy Original
ADS
APS
Original Density Detection
Paper Size Selection
B
Power Pack "Bias"
Optics Assembly
Exposure
Erase Lamp Unit
Erase
B
Power Pack "Charge"
Charge Corona Unit
Charge
Color Development Unit
Toner Supply Mechanism
Development
QL (LED)
Quenching
Main Development Unit
Toner Supply Mechanism
A
Cleaning Unit
Cleaning
Sorter
A
Toner Density Detection
B
Vr Detection
ID Sensor
PTL
PTL (LED)
Sorter Bins
Sort
Stack
Image Fusing
Paper Transport
Paper Separation
Image Transfer
Registration
Paper Feed
Manual Feed Table
Cassette
Fusing Unit
Transport Unit
Separation Corona
Transfer Corona
Registration Roller
Power Pack T/S

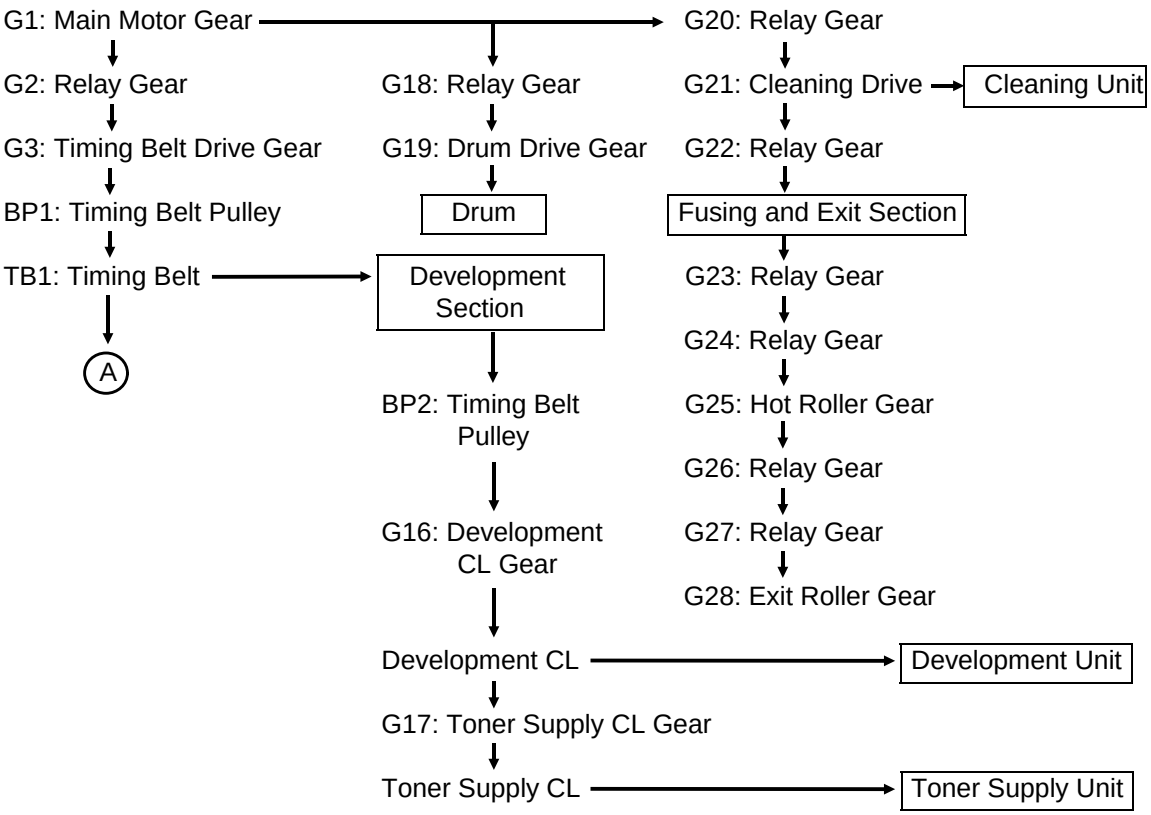
4. MECHANICAL COMPONENT LAYOUT

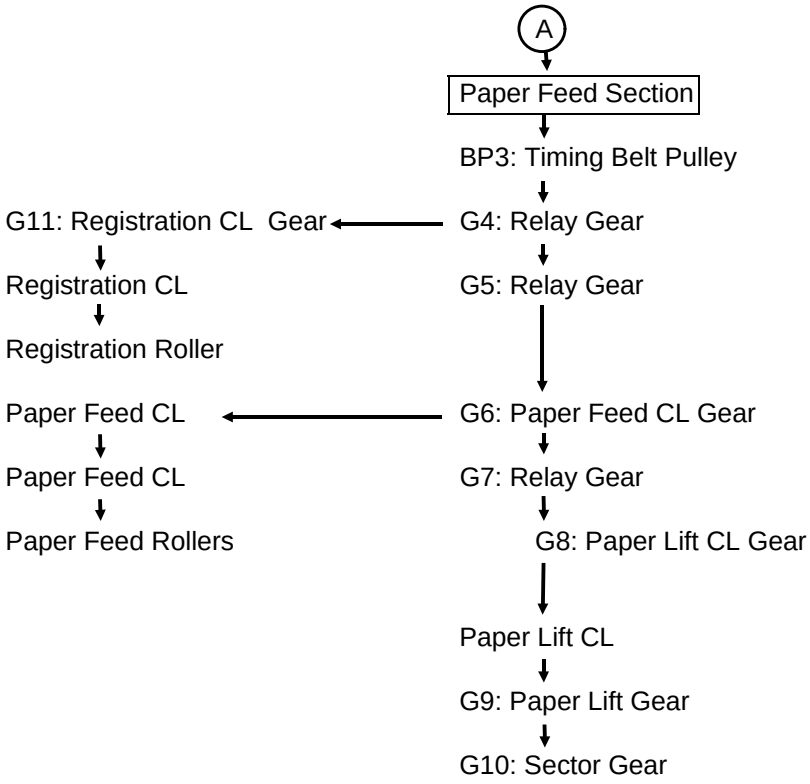


1. Third Mirror
2. Second Mirror
3. First Mirror
4. Exposure Lamp
5. Ozone Filter
6. Cleaning Unit
7. Lens
8. Quenching Lamp (QL)
9. Charge Corona Unit
10. Sixth Mirror
11. Erase lamp (EL)
12. OPC Drum
13. Development Unit
14. Toner Supply Unit
15. Optics Cooling Fans
16. Feed Roller
17. Manual Feed Table
18. Pick-up Roller
19. Separation Roller
20. Registration Rollers
21. Pre-transfer Lamp (PTL)
22. Transfer and Separation Corona Unit
23. Pick-off Pawls
24. Cleaning Brush
25. Cleaning Blade
26. Pressure Roller
27. Hot Roller
28. Exit Rollers
29. Hot Roller Strippers
30. Exhaust Blower

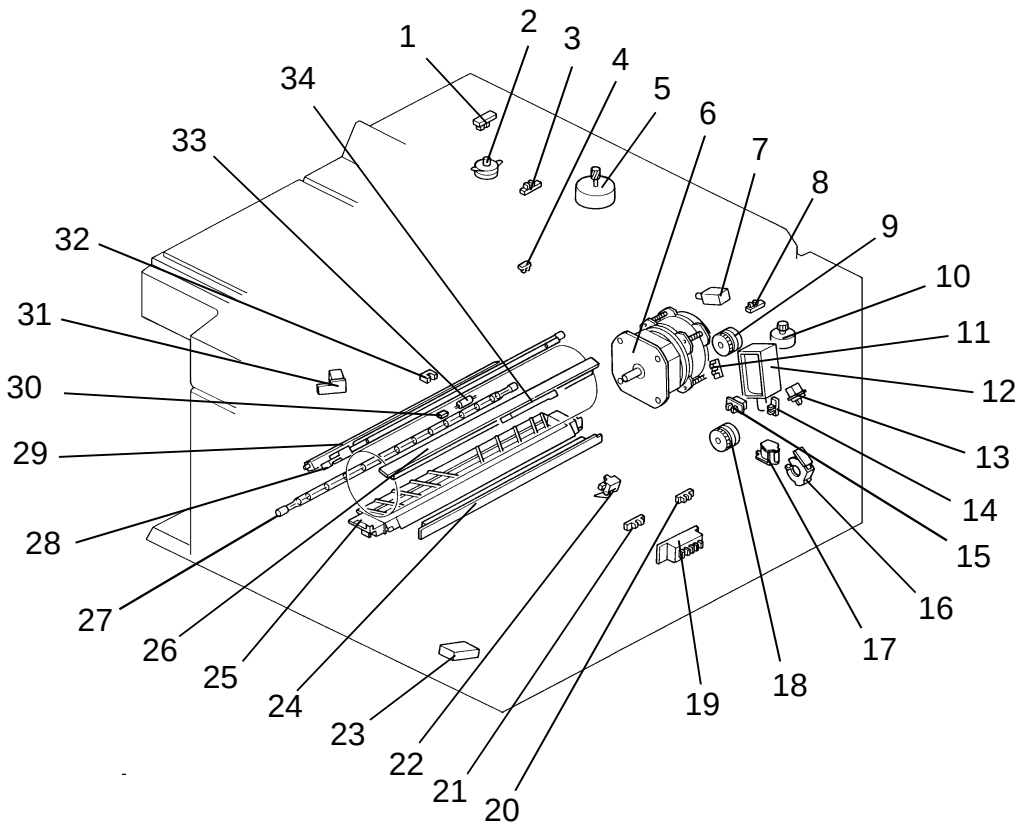
5. DRIVE LAYOUT



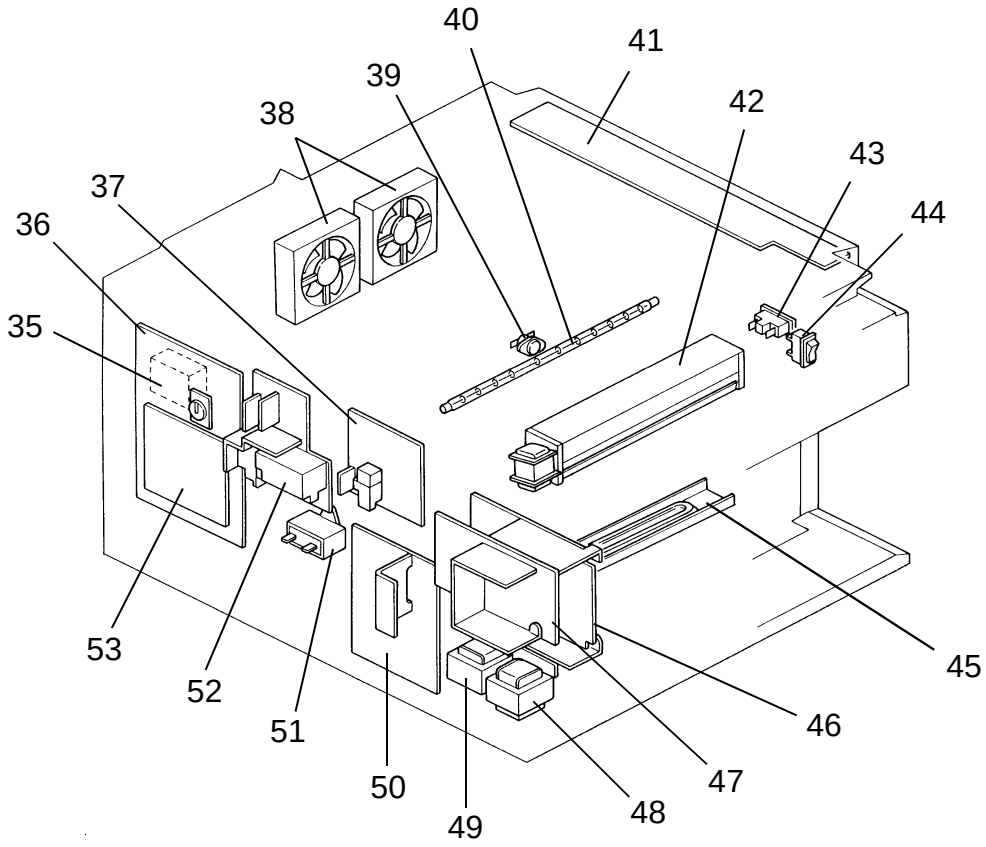



A
Paper Feed Section
BP3: Timing Belt Pulley
G4: Relay Gear
G11: Registration CL Gear
G5: Relay Gear
Registration CL
Registration Roller
G6: Paper Feed CL Gear
Paper Feed CL
G7: Relay Gear
Paper Feed CL
G8: Paper Lift CL Gear
Paper Feed Rollers
Paper Lift CL
G9: Paper Lift Gear
G10: Sector Gear

6. ELECTRICAL COMPONENT LAYOUT



1. Scanner H.P. Sensor
2. Lens Motor
3. Lens H.P. Sensor
4. Exit Sensor
5. Scanner Motor
6. Main Motor
7. Development CL Sol.
8. 4th/5th Mirror H.P. Sensor
9. Toner Supply Clutch
10. 4th/5th Mirror Motor
11. Toner End Sensor
12. Pick-up Roller Release Sol.
13. Manual Feed Table SW
14. Development Unit Set Sensor
15. Color Switch
16. Paper Lift CL Sol.
17. Paper Feed CL Sol.
18. Registration Clutch
19. Paper Size SW
20. Paper End Sensor
21. Paper Lift Sensor
22. Registration Sensor
23. Total Counter
24. Pre-transfer Lamp (PTL)
25. Transfer and Separation Corona Unit
26. Erase Lamp (EL)
27. Fusing Lamp
28. Charge Corona Unit
29. Quenching Lamp (QL)
30. Fusing Thermistor
31. Auto ID Sensor
32. Toner Overflow Sensor
33. Fusing Thermofuse
34. ID Sensor



35. Key Counter (Option)
36. Main Board
37. CC/Grid/Bias Power Pack
38. Optics Cooling Fan Motors
39. Optics Thermoswitch
40. Exposure Lamp
41. Operation Panel Board
42. Exhaust Blower Motor
43. Cover Safety SW
44. Main SW
45. Drum Anti-condensation Heater
46. Main DC Power Supply Board
47. Optional DC Power Supply Board (Option)
48. Optional Transformer (Option)
49. Main Transformer
50. AC Drive Board
51. Main Motor Capacitor
52. TC/SC Power Pack
53. Interface Board (Option)

7. ELECTRICAL COMPONENT DESCRIPTIONS

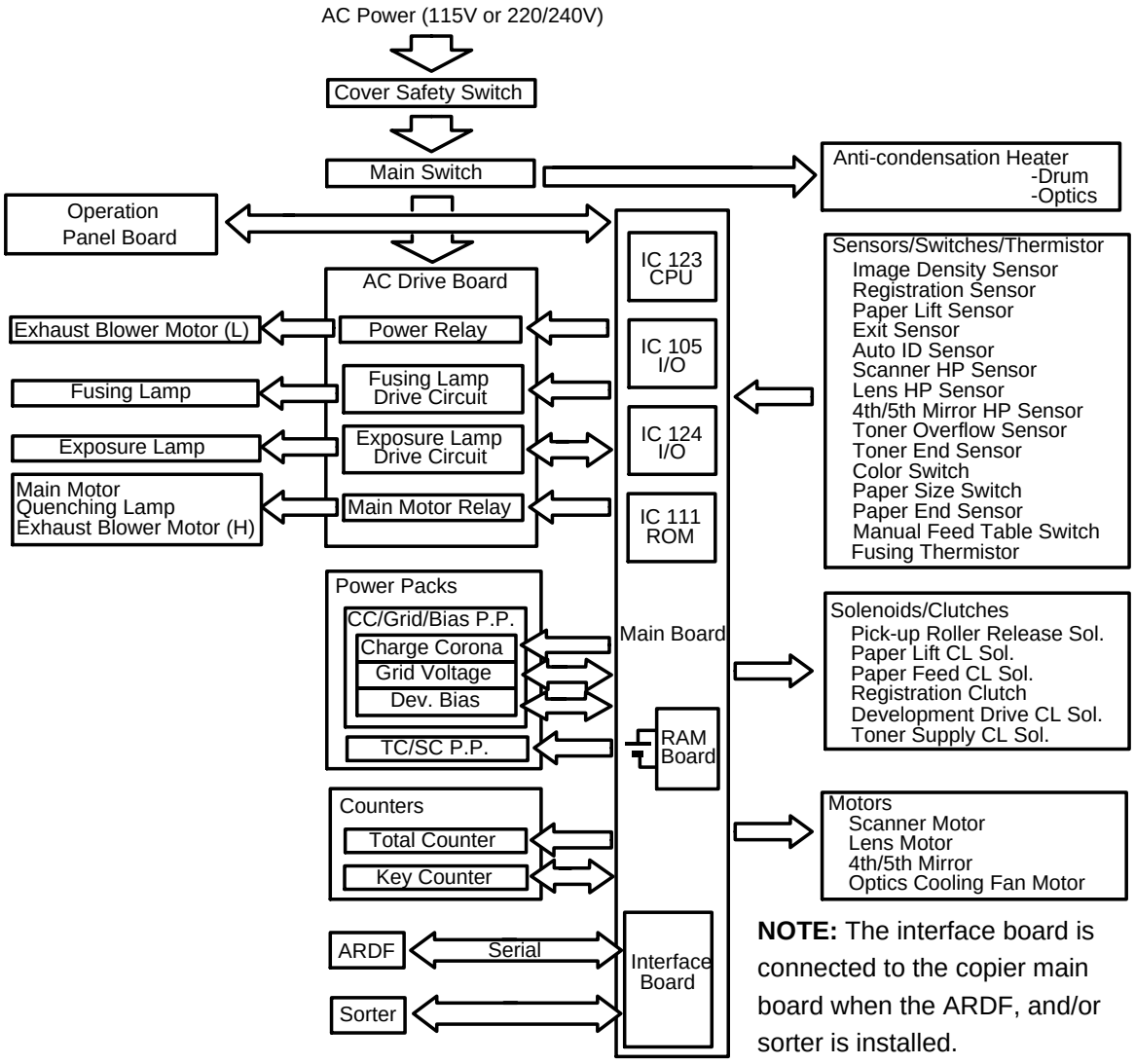
SYMBOL	NAME	FUNCTION	INDEX NO.
Motors			
M1	Main Motor	Drives all the main unit components except for the optics unit and fans. (115/220/240Vac)	6
M2	Scanner Motor	Drives the scanners (1st and 2nd). (dc stepper)	5
M3	Lens Motor	Moves the lens position according to the selected magnification. (dc stepper)	2
M4	4th/5th Mirror Motor	Moves the 4th/5th mirror position according to the selected magnification. (dc stepper)	10
M5	Optics Cooling Fan Motor-1	Prevents built up of hot air in the optics cavity. (24 Vdc)	38
M6	Optics Cooling Fan Motor-2	Prevents built up of hot air in the optics cavity. (24 Vdc)	38
M7	Exhaust Blower Motor	Removes heat from around the fusing unit and blower the ozone built up around the charge section to the ozone filter.	42
Magnetic Clutch			
MC1	Registration Clutch	Drives the registration roller.	18
MC2	Toner Supply Clutch	Drives the toner supply roller.	9
Solenoid			
SOL2	Paper Feed Clutch Solenoid	Starts paper feed	17
SOL4	Pick-up Roller Release Solenoid	a) After the paper is fed, releases the pick-up roller from next paper. b) When the manual feed table is used, releases the pick-up roller from the table.	12
SOL5	Paper Lift Clutch Solenoid	Lifts paper to the appropriate feed position.	16
SOL7	Development Clutch Solenoid	Drives the development unit.	7

SYMBOL	NAME	FUNCTION	INDEX NO.
Switches			
SW1	Main Switch	Supplies power to the copier.	44
SW2	Cover Safety Switch	Cuts the ac power line.	43
SW3	Paper Size Switch	Determines what size paper is in the first cassette.	19
SW8	Color Switch	Determines which color development unit is installed.	15
SW9	Manual Feed Table Switch	Detects when the manual feed table is open.	13
Sensor			
S1	Scanner Home Position Sensor	Informs the CPU when the 1st scanner is at the home position.	1
S2	Lens Home Position Sensor	Informs the CPU when the lens is at the home position (full size position).	3
S3	4th/5th Mirror Home Position Sensor	Informs the CPU when the 3rd scanner (4th/5th mirrors assembly) is at the home position (full size position).	8
S4	Registration Sensor	Detects misfeeds.	22
S5	Exit Sensor	Detects misfeeds.	4
S6	Paper End Sensor	Informs CPU when the cassette runs out of paper.	20
S8	Toner End Sensor	Detects when it is time to add toner.	11
S9	Toner Overflow Sensor	Detects when the used toner tank is full.	32
S10	Paper Lift Sensor	Detects the correct feed height of the cassette.	21
S11	Image Density (ID) Sensor	Detects the density of the image on the drum to control the toner density.	34
S12	Development Unit Set Sensor	Sensors whether or not the development unit is properly set.	14

SYMBOL	NAME	FUNCTION	INDEX NO.
Printed Circuit Board			
PCB1	Main Board	Controls all copier functions both directly and through the other PCBs.	36
PCB2	AC Drive Board	Drives all ac motors, the exposure lamp, fusing lamp, quenching lamp, exhaust blower motor.	50
PCB3	Main DC Power Supply Board	Rectifies 26 and 10 Vac input and outputs dc voltages.	46
PCB4	Auto Image Density Sensor (ADS)	Senses the background density of the original.	31
PCB5	Optional DC Power Supply Board	Rectifies 26 and 10 Vac input and outputs dc voltages.	47
PCB6	Interface Board	Interfaces between the copier main board and all the optional equipment's main board.	53
PCB7	Operation Panel Board	Informs the CPU of the selected modes and displays the situations on the panel.	41
Lamps			
L1	Exposure Lamp	Applies high intensity light to the original for exposure.	40
L2	Fusing Lamp	Provides heat to the hot roller.	27
L3	Quenching Lamp	Neutralizes any charge remaining on the drum surface after cleaning.	29
L4	Erase Lamp	Discharge the drum outside of the image area. Provides leading/trailing edge erase.	26
L5	Pre-transfer Lamp	Reduces charge on the drum surface before transfer.	24
Power Packs			
P1	CC/Grid/Bias Power Pack	Provides high voltage for the charge corona, grid, and the development roller bias.	37
P2	TC/SC Power Pack	Provides high voltage for the transfer and separation corona.	52

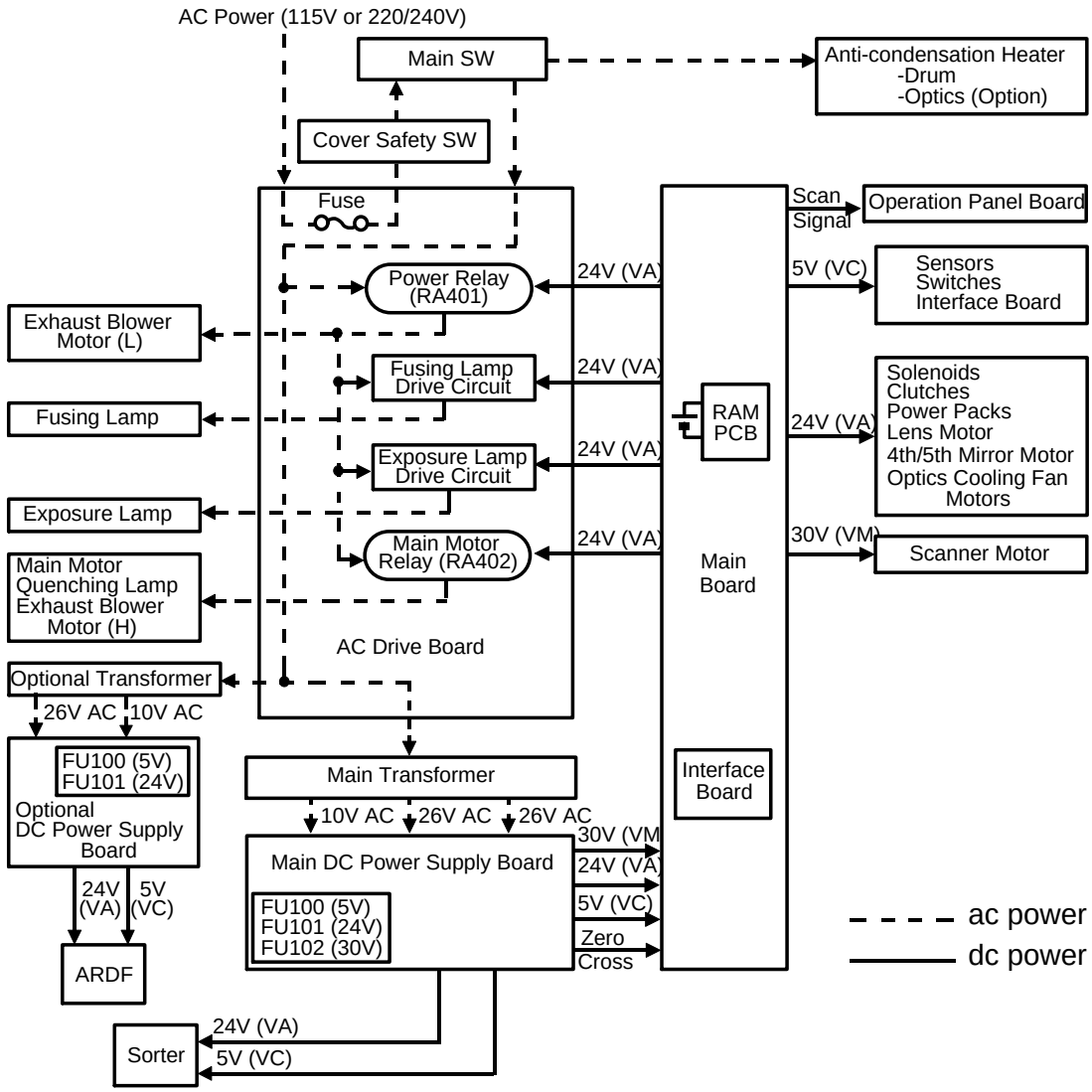
SYMBOL	NAME	FUNCTION	INDEX NO.
Heaters			
H1	Drum Anti-condensation Heater	Prevents moisture around the drum.	45
H2	Optics Anti-condensation Heater (Option)	Prevents moisture from forming on the optics.	N/A
Counters			
CO1	Total Counter	Keeps track of the total number of copies made.	23
CO2	Key Counter (Option)	Used for control of authorized use. Copier will not operate until installed.	35
Transformer			
TR1	Main Transformer	Steps down the wall voltage to 26 Vac and 10 Vac.	49
TR2	Optional Transformer (Option)	Steps down the wall voltage to 26 Vac and 10 Vac for the document feeder and duplex unit.	48
Others			
TH	Fusing Thermistor	Monitors the fusing temperature.	30
TF	Fusing Thermofuse	Provides back-up overheat protection in the fusing unit.	33
TS	Optics Thermoswitch	Provides back-up overheat protection around the exposure lamp.	39
C	Main Motor Capacitor	Start capacitor	51

8. OVERALL MACHINE CONTROL



The above diagram shows the control system of this copier in block form. The CPU (IC123) on the main board controls the timing of all copier's operation based on the CPU's internal clock. The CPU monitors the input signals from all sensors and controls the dc components directly or through two I/O chips (IC 105 and IC 124). It also controls ac components such as the fusing lamp, exposure lamp, main motor quenching lamp, and exhaust blower motor (High speed) directly via the ac drive board. The exhaust blower motor (Low speed) is controlled via the I/O chip (IC 124) and ac drive board. The charge corona, grid voltage and development bias are powered by the same power pack (P1) but are controlled separately as shown above. The main board has a RAM board for the service program mode and misfeed recovery. A battery backs up the power to the RAM board.

9. AC POWER AND DC POWER DISTRIBUTION



When this copier is plugged in and the main switch is turned off, ac power is supplied via the ac drive board to the anti-condensation heater. When the front cover and/or the exit cover is open, the cover safety switch completely cuts off power to all ac and dc components. The RAM board has a back up power supply (dc battery) for the service program mode and misfeed job recovery.

When the main switch is turned on, the ac power supply to the anti-condensation heater is cut off and ac power is supplied to the ac drive board. The main transformer receives wall outlet ac power through the ac

drive board and outputs 10 volts ac and 26 volts ac to the main dc power supply board.

The main dc power supply board converts the 10 volts ac input to +5 volts and a zero cross signal. There are two 26 volts ac inputs. The dc power supply board converts them to +24 volts and +30 volts.

The +5 volts and +24 volts are supplied to both the copier main board and the sorter main board. The zero cross signal and +30 volts are supplied to the copier main board.

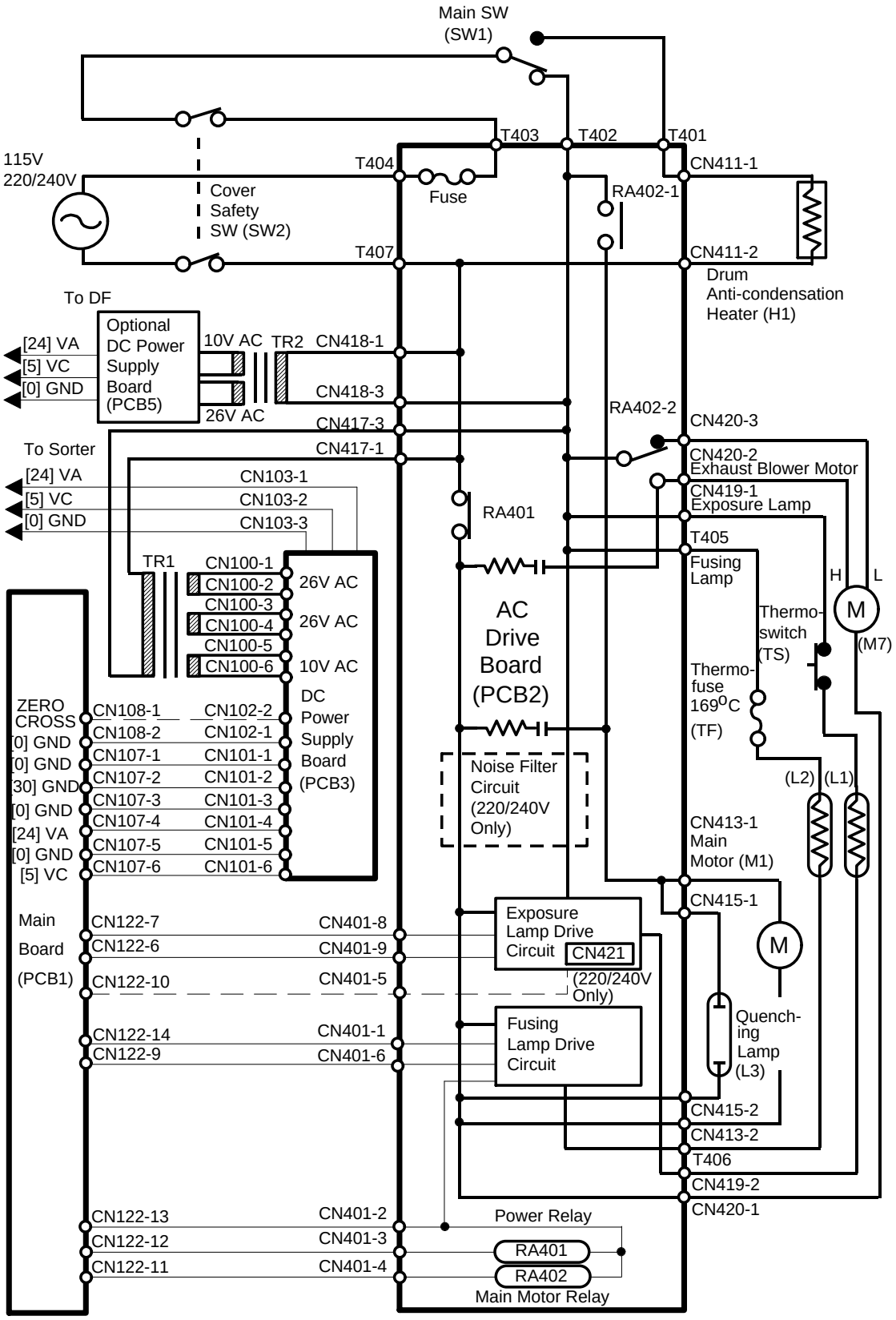
The copier main board supplies dc powers to all copier dc components. All sensors, and switches plus the interface board operate on +5 volts. The scanner motor operates on +30 volts. All other dc components including the power relay (RA401) and the main motor relay (RA402) operate on +24 volts. The ARDF has a separate dc power supply.

When the main board receives power, it activates the power relay (RA401) which then supplies ac power to the fusing lamp drive circuit, and the exposure lamp drive circuit on the ac drive board. The exhaust blower motor begins rotating at low speed. The fusing lamp drive circuit receives a trigger signal from the main board and the fusing lamp lights. The exposure lamp does not turn on until the main board send a trigger pulse to the exposure lamp drive circuit.

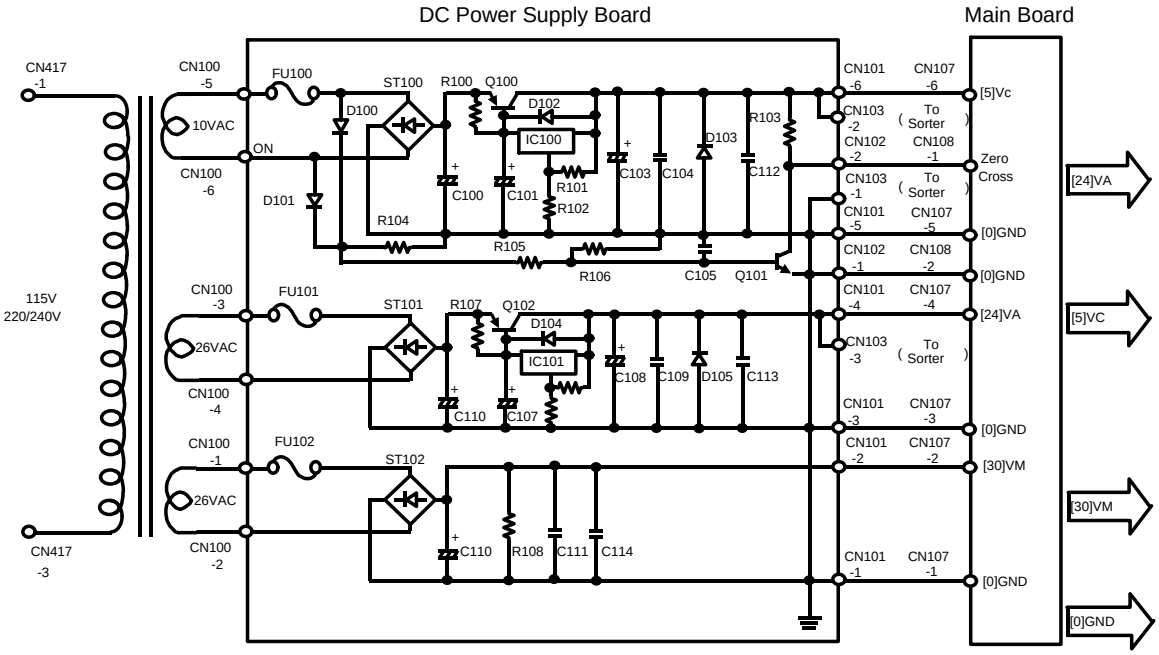
When the Start key is pressed, the main board energizes the main motor relay (RA402). Then, the main motor and the quenching lamp turn on and the exhaust blower starts rotating at high speed.

When the main switch is turned off, power is cut off to the main board and to RA401, and the drum and optional anticondensation heaters are turned on. The exposure lamp and the fusing lamp power lines are completely disconnected from the line voltage.

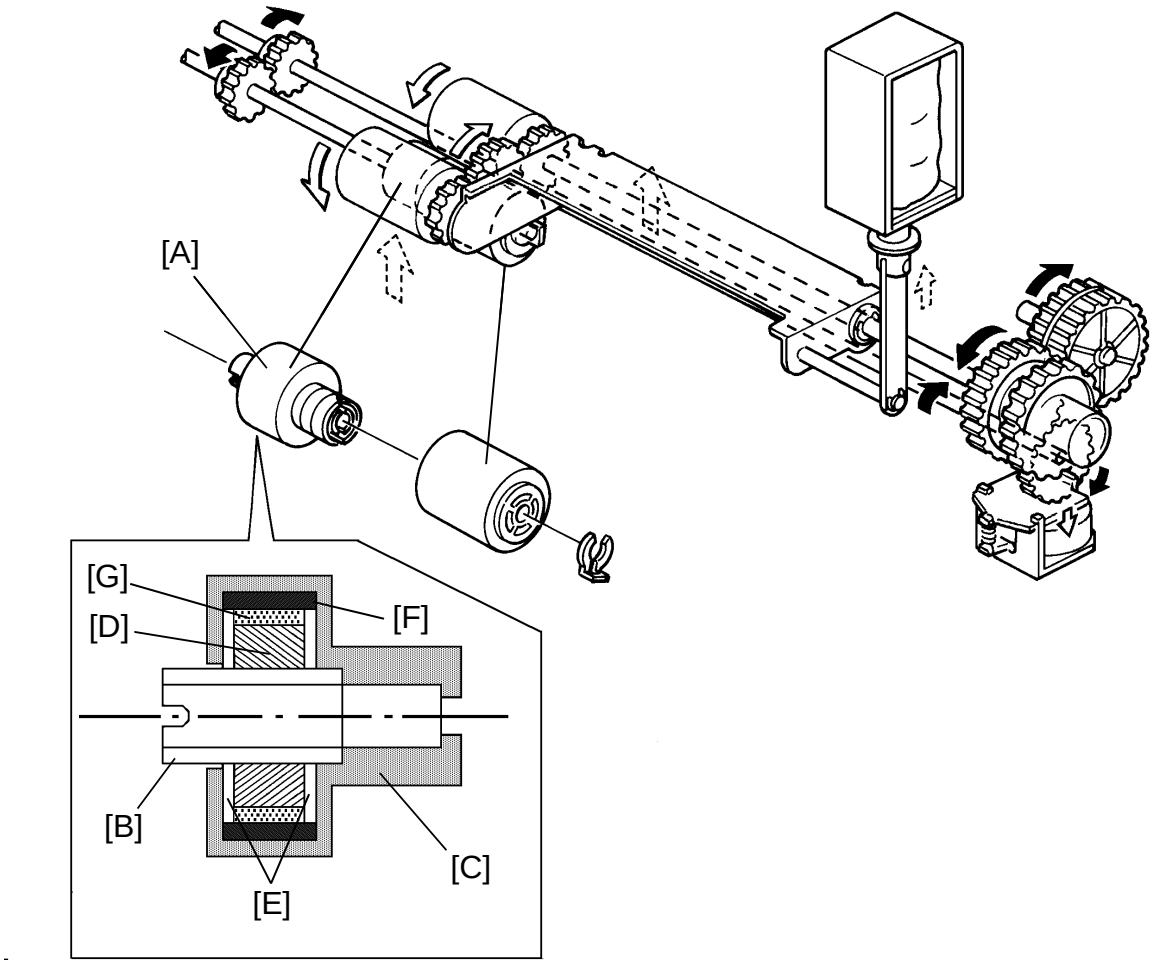
9.1 AC POWER DISTRIBUTION



9.2 DC POWER DISTRIBUTION



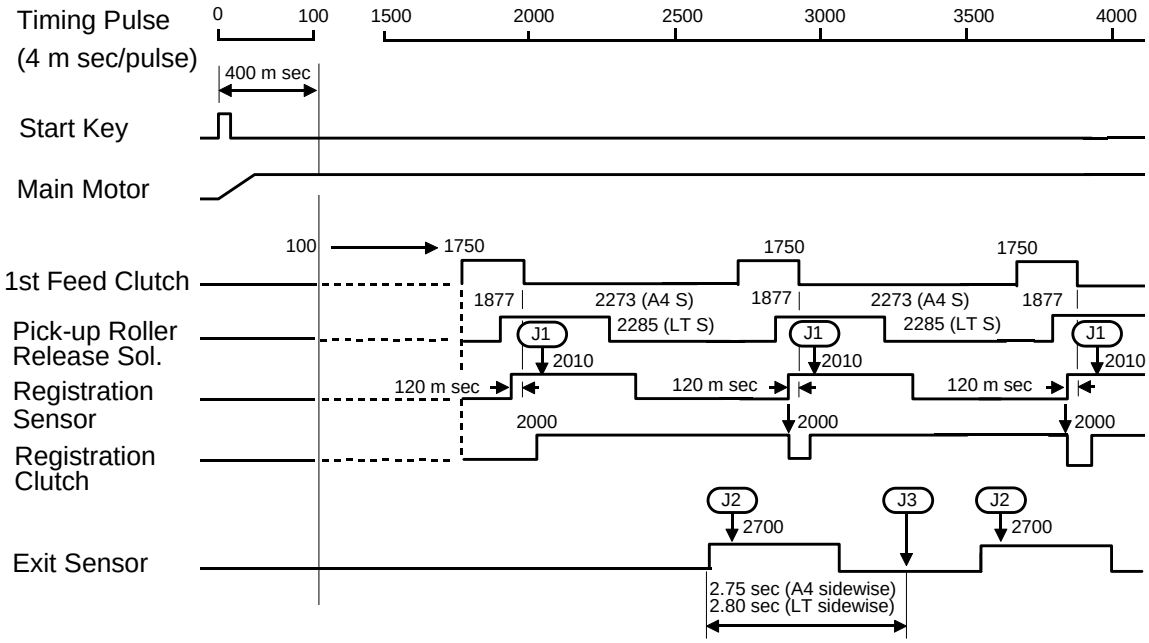
10. SLIP CLUTCH MECHANISM



The slip clutch [A] consistits of the input hub [B] and the output hub [C] which is the case of the clutch as well. The magnetic ring [D] and the steel spacers [E] are fitted onto the input hub. The ferrite ring [F] is fitted into the output hub. Ferrite powder [G] packed between the magnetic ring and the ferrite ring generates a constant torque due to magnetic force. The input hub and the output hub slip when the rotational force exceeds the constant torque.

This type of the slip clutch does not require lubrication.

11. PAPER FEED AND MISFEED DETECTION TIMING



PAPER FEED AND MISFEED DETECTION TIMING

The registration sensor and the exit sensor monitor the movement of the paper through the paper path. If the CPU determines that a misfeed exists, the Check Paper Path and the Misfeed Location indicators turn on. When the main switch is turned on, the CPU checks these two sensors for initial misfeed. During the copy cycle, the CPU performs three kinds of misfeed detection:

J1: Checks whether the registration sensor is actuated within 10 pulses (40 milliseconds) after the registration clutch turns on. (The Misfeed Location indicator "B" turns on.)

J2: Checks whether the exit sensor is actuated within 700 pulses (2.8 seconds) after the registration clutch turns on. (The Misfeed Location indicator "C" turns on.)

J3: Checks whether the copy paper has passed through the exit sensor 2.75 (A4 sideways) or 2.80 (Letter sideways) seconds after the exit sensor has been actuated. (The Misfeed Location indicator "D" turns on.)

12. INSTALLATION

12.1 INSTALLATION REQUIREMENTS

12.1.1. Environment

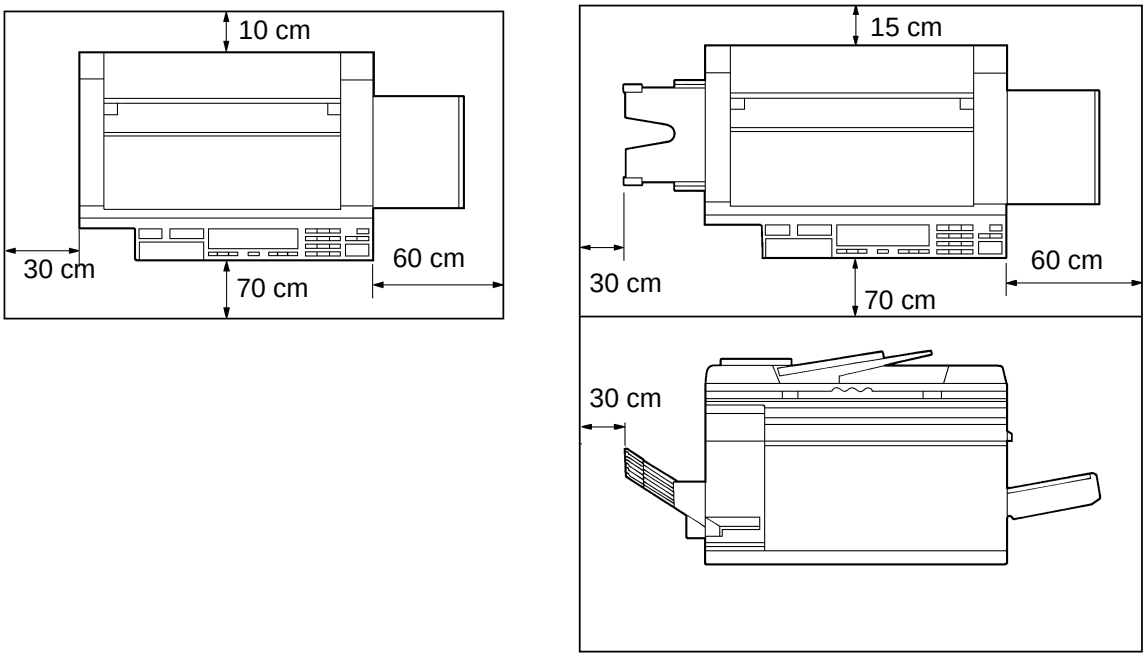
1. Temperature Range: 10°C to 30°C (50°F to 86°F)
2. Humidity Range: 15% to 90% RH
3. Ambient Illumination: Less than 1,500 lux. (Do not expose to direct sunlight.)
4. Ventilation: Room of more than 30 m^3. Room air should turn over at least 3 times/hour.
5. Ambient Dust: Less than 0.15 mg/m^3 (4×10^{-3} oz/yd^3)
6. The machine must not be subjected to sudden temperature changes. Do not install the machine where it will be directly exposed to cool air from an air conditioner or hot air from a heater.
7. Avoid placing the machine in an area filled with corrosive gas.
8. Do not install at any location over 2,000 meters (6,500 feet) above sea level.
9. Place the machine on a strong and level base.
10. Avoid any area where the machine may be subjected to frequent, strong vibrations.

12.1.2. Machine Level

1. Front to back: Within 5 mm (0.2") of level
2. Right to left: Within 5 mm (0.2") of level

Make sure that the machine is level using a carpenter’s level.

12.1.3. Minimum Space Requirements



1. Front : 70 cm (27.6")
2. Back : 10 cm (3.9")
   : 15 cm (6.0") (when the sorter is installed.)
3. Right : 60 cm (31.5")
4. Left : 30 cm (11.8")

NOTE: Make sure there is at least 15 cm (6.0") clearance behind the copier so that the sorter will not be damaged when it is opened.

12.1.4. Power Requirements

1. Input voltage level:
   110V/60Hz : More than 15A (for Taiwan)
   115V/60Hz : More than 15A (for N.A.)
   220V/50Hz : More than 8A (for EU.)
   220V/60Hz : More than 8A (for EU.)
   230–240V/50Hz : More than 8A (for EU.)

2. Permissible voltage fluctuation: ±10%
3. Do not set anything on the power cord.

NOTE: a) Be sure to ground the machine. (Do not connect the grounding wire to a gas pipe.)

b) Make sure the plug is firmly inserted in the outlet.

c) Avoid multiwiring.

12.2 INSTALLATION PROCEDURE

12.2.1. Introduction

This section covers only those parts of the copier and option installation procedures that differ from the A048.

The following table shows which options can be used on the A048, A054, and A075 copiers:

	A048 Copier	A054 Copier	A075 Copier
Document Feeder	(A465)	(A318) **NOTE (1)**	(A465)
	(A318)		(A318)
Sorter	(A490)	(A490)	(A490)
Duplex Unit	(A491)	(A491) **NOTE (2)**	**NOTE (4)**
Color Development Unit	(A313)	(A313)	(A313)
DC Power Supply Unit	(A494)	**NOTE (3)**	(A494)

( ) : Product Code

NOTE: (1) The A465 DF can be installed on the A054 copier; however, the A465 DF does not have a DF positioning sensor, so APS mode will not function in platen mode.

(2) A054 copiers with the destination codes A054-26, -27 -46, and -47 are equipped with a duplex unit as a standard feature.

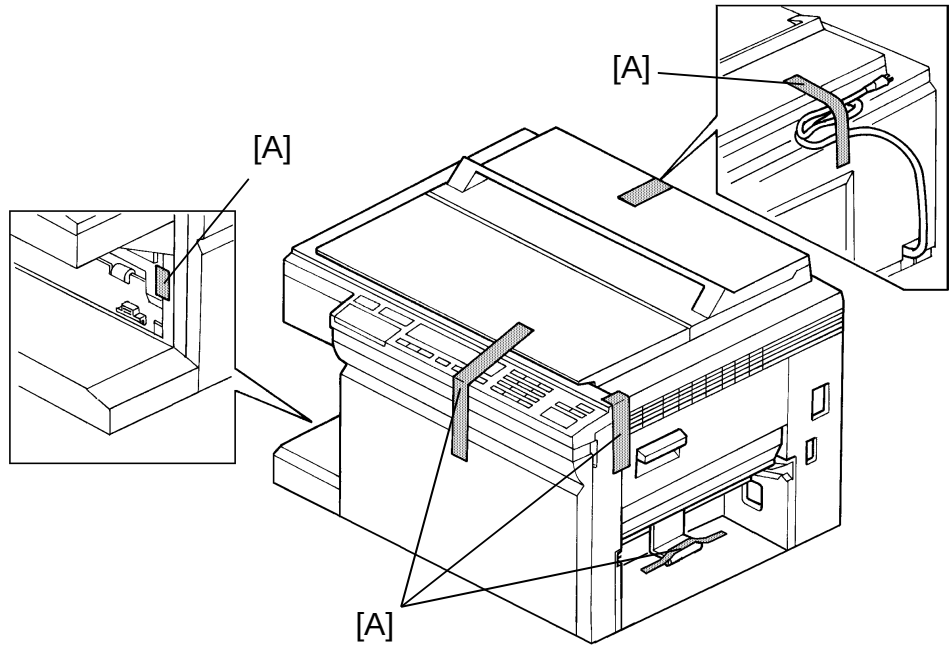
(3) The dc power supply unit for the document feeder and duplex unit and the interface board are already installed on the A054 copier at the factory. The optional dc power supply unit (Unit code #A494) is not required.

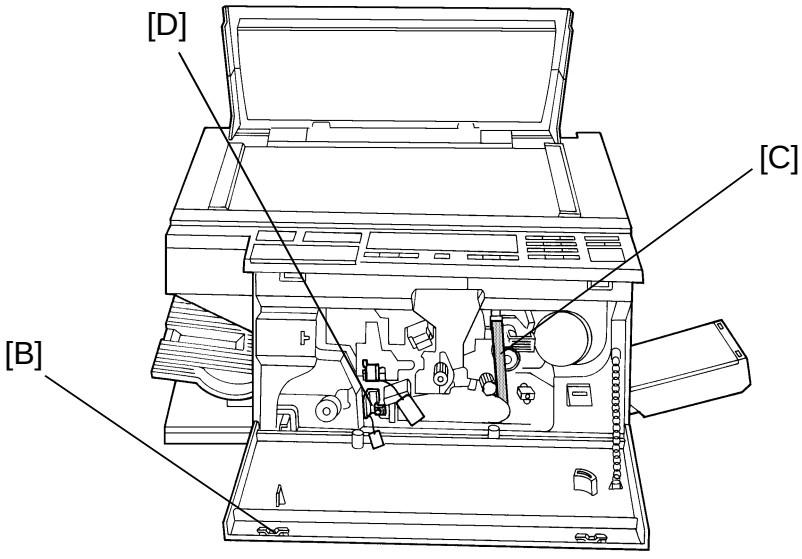
(4) The A075 copier does not have a duplex unit as an option.

(5) The installation procedures of the following options are the same as those of the A048 copier. Refer to each section of the A048 copier as follows:

1. Key Counter Holder — Refer to page 3-12.
2. Optics Anti-condensation Heater — Refer to page 3-13.
3. Color Development Unit — Refer to page 3-14 to16.

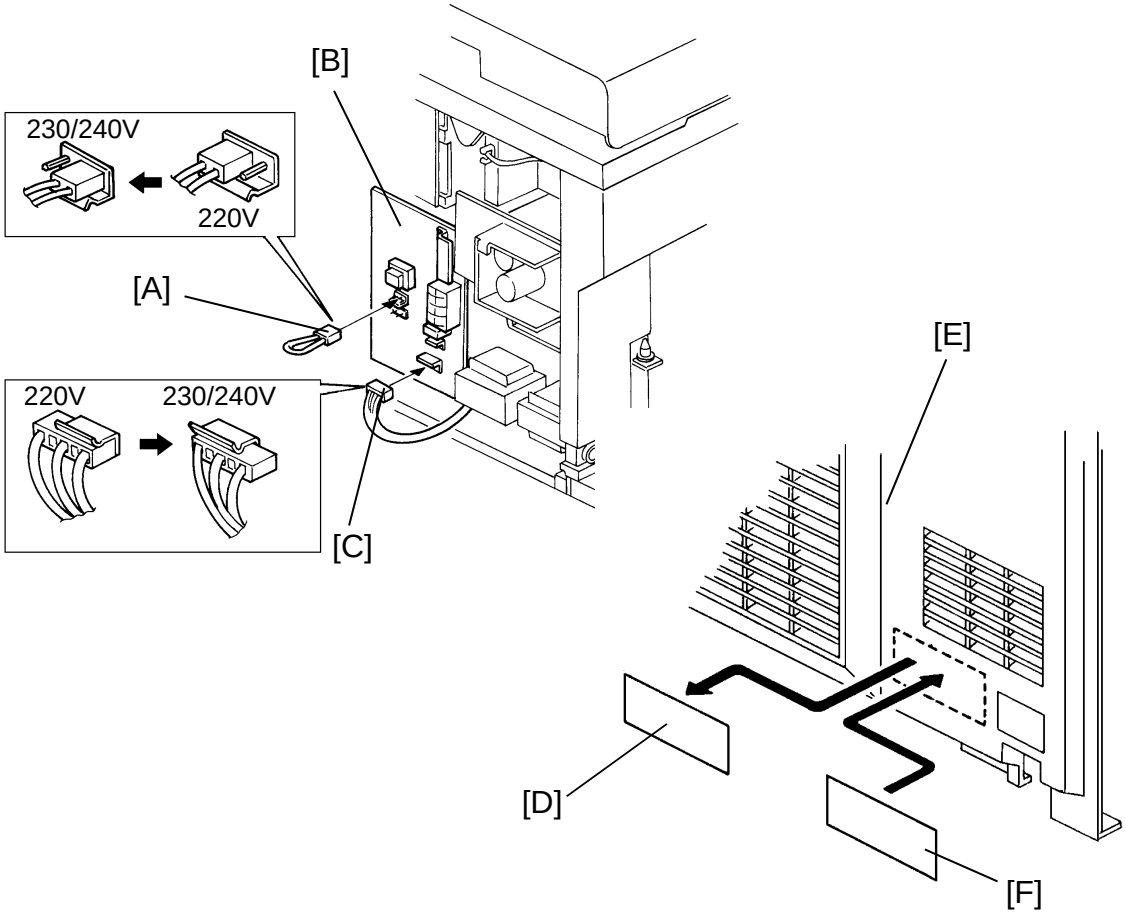
12.2.2. Copier Installation





1. Remove the strips of tape [A] from the copier at the locations shown.
2. Open the front cover [B], and remove the strips of tape [C].
3. Remove the transport unit lock plate [D] (2 screws).
4. Do **steps 5 to 21** of the A048 copier installation procedure (page 3-5 to 9).
   - See page 3-11 for the cassette modification procedure.

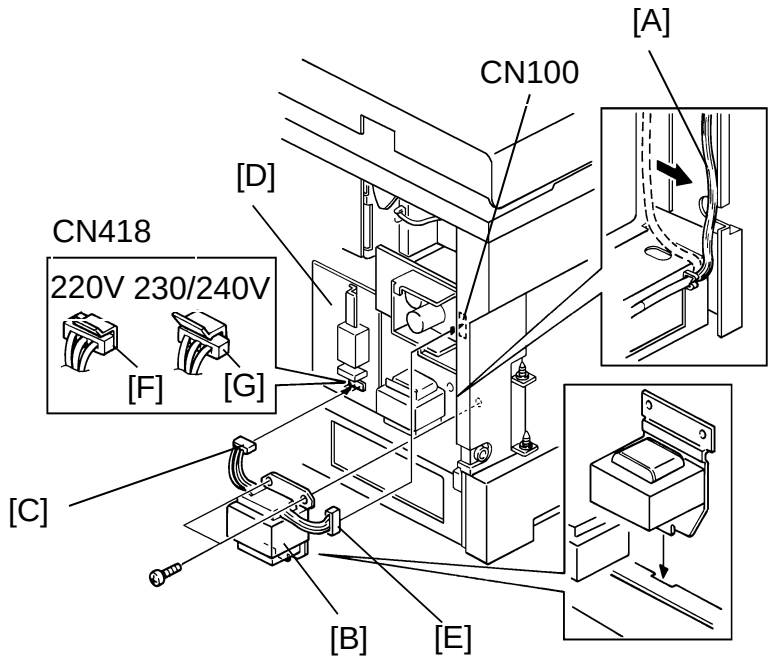
12.2.3. 220/230/240V Conversion



NOTE: In areas where 230 or 240 volts is the standard, the connectors on the ac drive board must be repositioned as explained below. This procedure is also done after step 1 of the copier installation procedure.

1) Remove the rear cover (4 screws).
2) Disconnect the short connector [A] (2P/White) on the ac drive board [B] from CN421 and reconnect it to CN 421 as shown in the illustration.
3) Disconnect the transformer connector [C] (3P/White) on the ac drive board from CN417 and reconnect it to CN417 as shown in the illustration.
4) Reinstall the rear cover.
5) Change the data of SP mode #12 from "0" to "1". (Step 17 explains how to access the SP mode.)
6) Remove the 220V caution decal [D] from the rear cover [E].
7) Adhere the 230V caution decal [F] (enclosed with the machine) to the rear cover. (This step is required only in 230 volts areas.)

12.3 DC POWER SUPPLY UNIT INSTALLATION

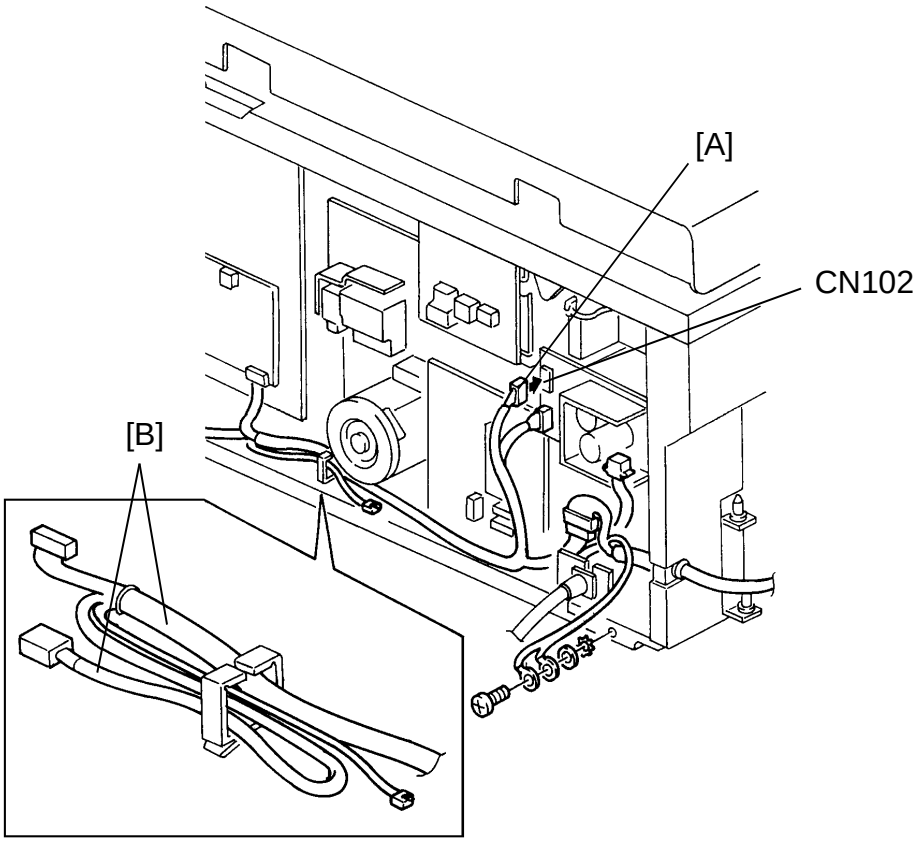


1. Do **steps 1 to 10** of the installation procedure for the A048 copier (page 3-18 to 20).
2. To prevent damage to the ac harness [A] when installing the optional transformer [B], reposition the harness as shown.
3. Install the optional transformer [B] (2 screws).
4. Connect the connector [C] (3P/Black) of the transformer to CN418 on the ac drive board [D] and the connector [E] (4P/White) to CN 100 on the optional dc power supply unit.

NOTE: 1. The transformer connectors of the transformer are positioned differently for the 220V and 230/240V machines.
In the 220V machine, connect the connector [F] to CN418 as shown.
In the 230/240V machine, connect the connector [G] to CN418 as shown.

2. Connect the optional dc harness. (See the installation procedure for each option.)

12.4 DOCUMENT FEEDER INSTALLATION

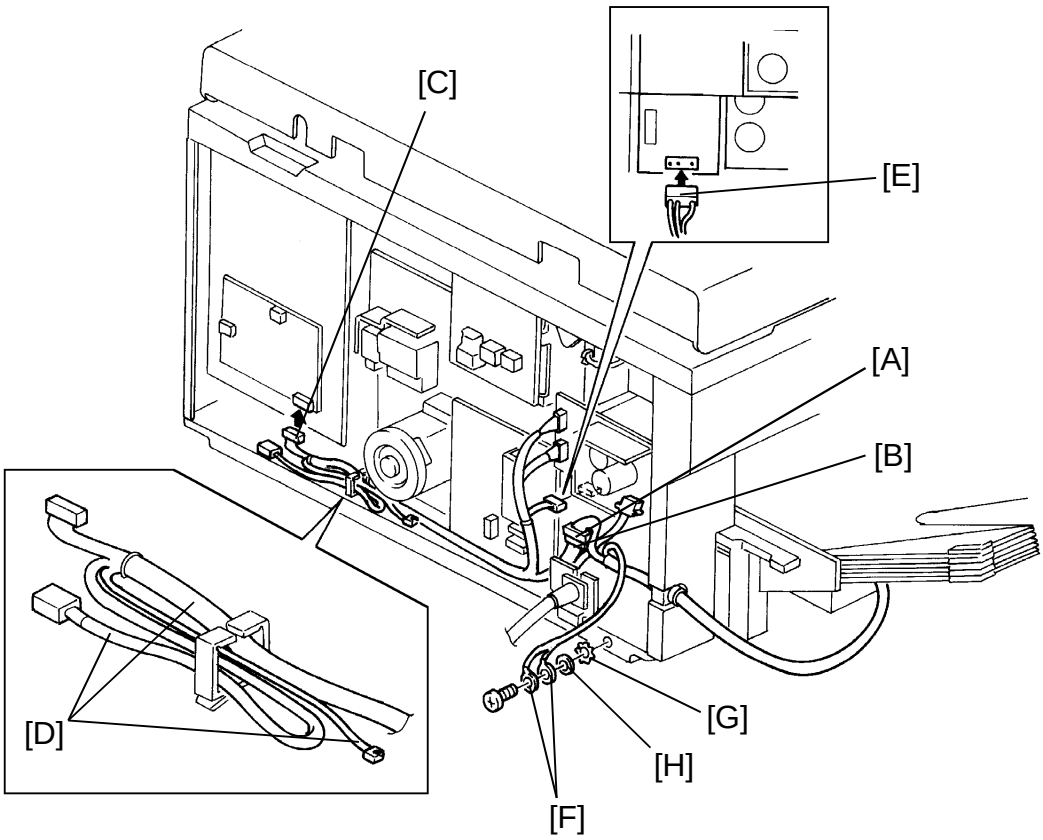


1. Do **steps 1 to 20** of the installation procedure for the A048 copier (page 8-25 to 28).
2. Connect the harness connector [A] to CN102 on the DC power supply unit.

NOTE: Clamp the harnesses [B] as shown in the illustration.

3. Do **steps 22 to 31** of the installation procedure for the A048 copier (page 8-28 to 30).

12.5 SORTER INSTALLATION



1. Do **steps 1 to 10** of the installation procedre for the A048 copier (page 9-13 to 14).
2. Connect the sorter dc harness [A] (10P/Brown) to the optional harness connector [B].
3. Connect the optional harness connector [C] to CN203 on the interface board [D].

NOTE: Clamp the harnesses [D] as shown in the illustration.

4. Connect the dc harness [E] (3P/White) to CN103 on the main dc power supply unit.
5. Secure the grounding wire [F] (1 screw, toothed washer [G], and spring washer [H]) on the bottom plate as shown.
6. Plug in the copier power supply cord.
7. Change the SP Mode #71 data to "1" (sorter instruction).
8. Reinstall the rear cover and turn on the main switch.
9. Check the operation of the sorter.

13. ELECTRICAL DATA

13.1 COPIER MAIN BOARD SCHEMATIC

13.2 OPERATION PANEL BOARD SCHEMATIC

13.3 COPIER TIMING CHART

NOTE: The schematics for the following PCBs are common with the A048 copier and the A054 copier.

- AC Drive Board
- Interface Board
- Auto Image Density Sensor Board
- Optional DC Power Supply Board

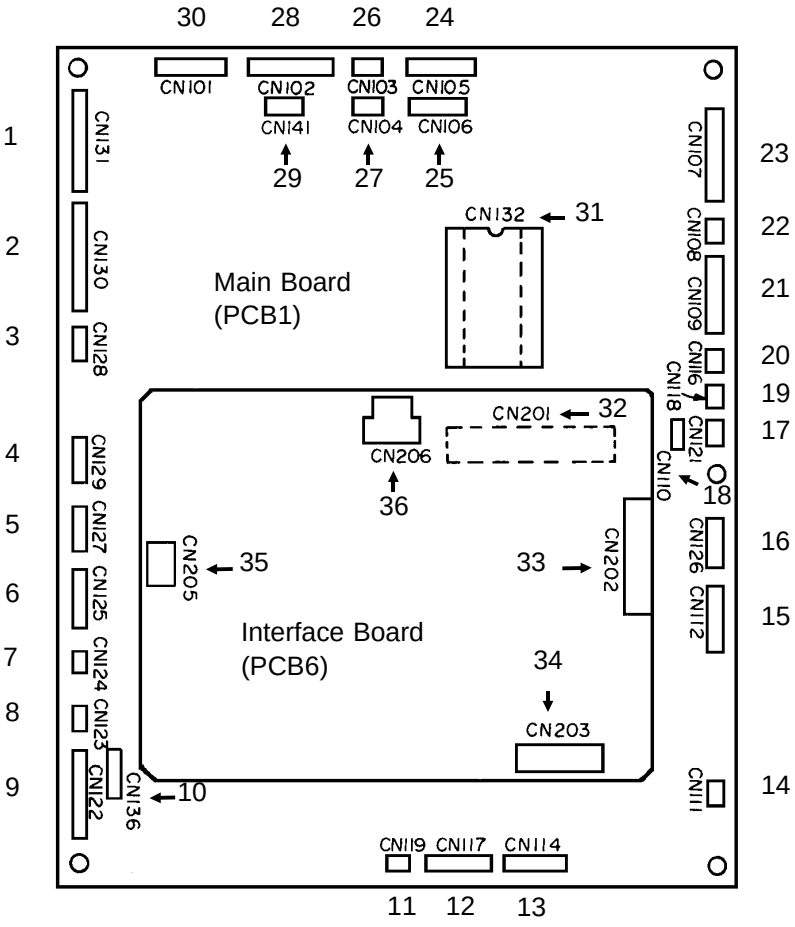
Copier Electrical Components

Index No.	Description	Symbol	P to P
1	Scanner H.P. Sensor	S1	O10
2	Lens Motor	M3	O13
3	Lens H.P. Sensor	S2	O11
4	Exit Sensor	S5	O7
5	Scanner Motor	M2	O12
6	Main Motor	M1	B1
7	Development CL Sol.	SOL7	O20
8	4th/5th Mirror H.P. Sensor	S3	O12
9	Toner Supply Clutch	MC2	O20
10	4th/5th Mirror Motor	M4	O14
11	Toner End Sensor	S8	O8
12	Pick-up Roller Release Sol.	SOL4	O17
13	Manual Feed Table SW	SW9	O5
14	Development Unit Set Sensor	S12	O8
15	Color Switch	SW8	O9
16	Paper Lift CL Sol.	SOL5	O18
17	Paper Feed CL Sol.	SOL2	O16
18	Registration Clutch	MC1	O19
19	Paper Size SW	SW3	O2
20	Paper End Sensor	S6	O4
21	Paper Lift Sensor	S10	O6
22	Registration Sensor	S4	O6
23	Total Counter	CO1	O21
24	Pre-transfer Lamp (PTL)	L5	H6
25	Transfer and Separation Corona Unit	—	—
26	Erase Lamp (EL)	L4	H8
27	Fusing Lamp	L2	A7
28	Charge Corona Unit	—	—
29	Quenching Lamp (QL)	L3	A8
30	Fusing Thermistor	TH	H5
31	Auto ID Sensor	PC84	O10
32	Toner Overflow Sensor	S9	O17
33	Fusing Thermofuse	TF	B7
34	ID Sensor	S11	H5
35	Key Counter	CO2	O22
36	Main Board	PCB1	K2
37	CC/Grid/Bias Power Pack	P1	H7
38	Optics Cooling Fan Motors	M5/M6	O15
39	Optics Thermoswitch	TS	A10
40	Exposure Lamp	L1	A10
41	Operation Panel Board	PCB7	G2
42	Exhaust Blower Motor	M7	B8
43	Cover Safety SW	SW2	B3
44	Main SW	SW1	D3
45	Drum Anti-condensation Heater	H1	F4
46	Main DC Power Supply Board	PCB3	F8
47	Optional DC Power Supply Board	PCB5	E8
48	Optional Transformer	TR2	E6
49	Main Transformer	TR1	E5
50	AC Drive Board	PCB2	C11
51	Main Motor Capacitor	C	—
52	TC/SC Power Pack	P2	H7
53	Interface Board	PCB6	J17

Copier Connectors

Index No.	CN No.	Component	Symbol	Type	P to P
1	CN131	Main Board (Operation Panel Board)	PCB1	15P/W	J3-J4
2	CN130	Main Board (Operation Panel Board)	PCB1	13P/W	J1-J2
3	CN128	Main Board (Pick-up Roller Release Solenoid)	PCB1	2P/W	M17
4	CN129	Main Board (Total Counter)	PCB1	4P/B	M21
5	CN127	Main Board (Key Counter)	PCB1	4P/T	M22
6	CN125	Main Board (Paper Lift and Paper End Sensors)	PCB1	6P/W	M5-M6,M4
7	CN124	Main Board (Paper Lift Clutch Solenoid)	PCB1	2P/Y	M18
8	CN123	Main Board (Development Unit Set Sensor)	PCB1	4P/W	M8-M9
9	CN122	Main Board (Fusing Thermistor and Scanner HP Sensor)	PCB1	14P/W	J5,M10
10	CN136	Main Board (Open)	PCB1	5P/T	—
11	CN119	Main Board (Paper Feed Clutch Solenoid)	PCB1	2P/B	M16
12	CN117	Main Board (Paper Size Switches)	PCB1	8P/W	M1,M2
13	CN114	Main Board (Toner End Sensor, Color and Manual Feed Table SW)	PCB1	8P/C	M8,M9,M5
14	CN111	Main Board (Registration Clutch)	PCB1	2P/B	M19
15	CN112	Main Board (CC/Grid/Bias Power Pack)	PCB1	8P/W	J6-J7
16	CN126	Main Board (TC/SC Power Pack)	PCB1	5P/W	J7
17	CN121	Main Board (Pre- transfer Lamp)	PCB1	2P/C	J6
18	CN110	Main Board (Image Density Sensor)	PCB1	3P/W	J5
19	CN118	Main Board (Toner Supply Clutch)	PCB1	2P/Y	M20-M21
20	CN116	Main Board (Development Clutch Solenoid)	PCB1	2P/W	M20
21	CN109	Main Board (Erase Lamp)	PCB1	9P/W	J8-J9
22	CN108	Main Board (Main DC Power Supply Board)	PCB1	2P/B	J12
23	CN107	Main Board (Main DC Power Supply Board)	PCB1	6P/W	J12-J13
24	CN105	Main Board (Scanner Motor)	PCB1	6P/T	M12
25	CN106	Main Board (4th/5th Mirror Motor)	PCB1	6P/W	M14
26	CN103	Main Board (Optics Cooling Fan Motor-1)	PCB1	2P/W	M15
27	CN104	Main Board (Optics Cooling Fan Motor-2)	PCB1	2P/W	M15
28	CN102	Main Board (Lens Motor)	PCB1	12P/W	M13
29	CN141	Main Board (Exit Sensor)	PCB1	3P/W	M7
30	CN101	Main Board (Toner Overflow Sensor)	PCB1	10P/W	M7
31	CN132	Main Board/ RAM Board	PCB1	24P/B	—
32	CN201	Main Board/Interface Board	PCB1	30P/B	J17
33	CN202	Interface Board (Open)	PCB6	20P/B	—
34	CN203	Interface Board (Sorter)	PCB6	10P/C	J13- J14
35	CN205	Interface Board (Open)	PCB6	4P/C	J15-J16
36	CN206	Interface Board (DF)	PCB6	2P/B	J20
37	TT	TC/SC Power Pack	P2	1P/-	H7
38	CN1	TC/SC Power Pack	P2	5P/W	H7
39	TS	TC/SC Power Pack	P2	1P/-	H7
40	CN1	CC/G/B Power Pack	P1	8P/W	H6-H7
41	TG	CC/G/B Power Pack	P1	1P/-	G6-G7
42	TB	CC/G/B Power Pack	P1	1P/-	G7
43	CN3	Optics Anti-condensation Heater (Option)	H2	2P/R	E5
44	T	Optics Thermoswitch	TS	1P/-	A10
45	T	Optics Thermoswitch	TS	1P/-	A10
46	CN4	Exposure Lamp	L1	1P/W	B10
47	T7	Cover Safety Switch	SW2	1P/-	B3
48	T6	Cover Safety Switch	SW2	1P/-	B4
49	T5	Cover Safety Switch	SW2	1P/-	B4
50	T4	Cover Safety Switch	SW2	1P/-	B3
51	T3	Main Switch	SW1	1P/-	B3
52	T1	Main Switch	SW1	1P/-	D3
53	T2	Main Switch	SW1	1P/-	D3
54	CN3	Flat Cable for Exposure Lamp	—	2P/W	B10
55	CN102	Main DC Power Supply Board	PCB3	2P/W	G9
56	CN102	Optional DC Power Supply Board	PCB5	4P/W	E9
57	CN101	Main DC Power Supply Board	PCB3	6P/W	F9-G9
58	CN101	Optional DC Power Supply Board	PCB5	4P/W	F9
59	CN100	Main DC Power Supply Board	PCB3	6P/W	F8-G8
60	CN100	Optional DC Power Supply Board	PCB5	4P/W	E8

Index No.	CN No.	Component	Symbol	Type	P to P
61	CN103	Main DC Power Supply Board	PCB3	3P/W	F9
62	T403	AC Drive Board	PCB2	1P/R	C4
63	T404	AC Drive Board	PCB2	1P/R	C4
64	CN1	Power Supply Cord	—	2P/W	B4
65	CN2	Sorter	—	10P/T	E15-E16
66	CN411	AC Drive Board	PCB2	2P/P	E4
67	T401	AC Drive Board	PCB2	1P/W	D4
68	T407	AC Drive Board	PCB2	1P/W	C4
69	CN2	Drum Anti-condensation Heater	H1	2P/R	E4
70	CN417	AC Drive Board	PCB2	3P/W	E6
71	CN418	AC Drive Board	PCB2	3P/B	E6
72	T402	AC Drive Board	PCB2	1P/B	D4
73	T405	AC Drive Board	PCB2	1P/Y	B7
74	T406	AC Drive Board	PCB2	1P/Y	C9
75	CN415	AC Drive Board	PCB2	2P/B	C9
76	CN413	AC Drive Board	PCB2	2P/B	C8,C9
77	CN420	AC Drive Board	PCB2	3P/W	C7,C9
78	CN419	AC Drive Board	PCB2	2P/Y	C10
79	CN421	AC Drive Board (220/240V only)	PCB2	2P/W	C9
80	CN401	AC Drive Board	PCB2	9P/W	E9-E11
81	TC	CC/G/B Power Pack	P1	1P/-	H6
82	CN1	Document Feeder	—	4P/W	E15-E16
83	CN804	Key Counter (Relay Connector)	CO2	4P/W	N22
84	CN836	Toner Overflow Sensor	S9	3P/W	O7
85	CN844	Exit Sensor	S5	3P/W	O7
86	CN806	Scanner HP Sensor	S1	3P/W	O10
87	CN825	Lens Motor (Relay Connector)	M3	6P/W	N13
88	CN824	Lens HP Sensor	S2	3P/W	O11
89	CN839	Relay Connector for Exit Sensor	—	3P/W	N7
90	CN808	Relay Connector for Fusing Thermistor	—	2P/W	I5
91	CN822	Relay Connector for Toner End Sensor	—	3P/W	N8
92	CN840	Toner End Sensor	S8	3P/W	O8
93	CN826	4th/5th Mirror HP Sensor	S3	3P/W	O11-O12
94	CN823	Relay Connector for Development Unit Set Sensor	—	3P/S	N8-N9
95	CN821	Color Switch	SW8	3P/W	O9
96	CN818	Manual Feed Table Switch	SW9	2P/W	O5
97	CN842	Development Unit Set Sensor	S12	3P/S	O8-O9
98	CN817	Relay Connector for 1st Paper Size Switch	—	6P/W	N2
99	CN843	Paper Size Switch	SW3	6P/W	O2
100	CN845	Paper End Sensor	S6	3P/W	O4
101	CN846	Paper Lift Sensor	S10	3P/W	O5-O6
102	CN832	Registration Sensor	S4	3P/W	O6
103	CN802	Total Counter (Relay Connector)	CO1	3P/B	N21
104	CN816	Relay Connector for Registration Sensor	—	3P/W	N6
105	CN5	Fusing Lamp	L2	1P/W	A7
106	CN827	Relay Connector for Toner Overflow Sensor	—	3P/W	N7
107	CN301	Auto Image Density Sensor	PCB4	4P/W	O10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Main Board
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CN202
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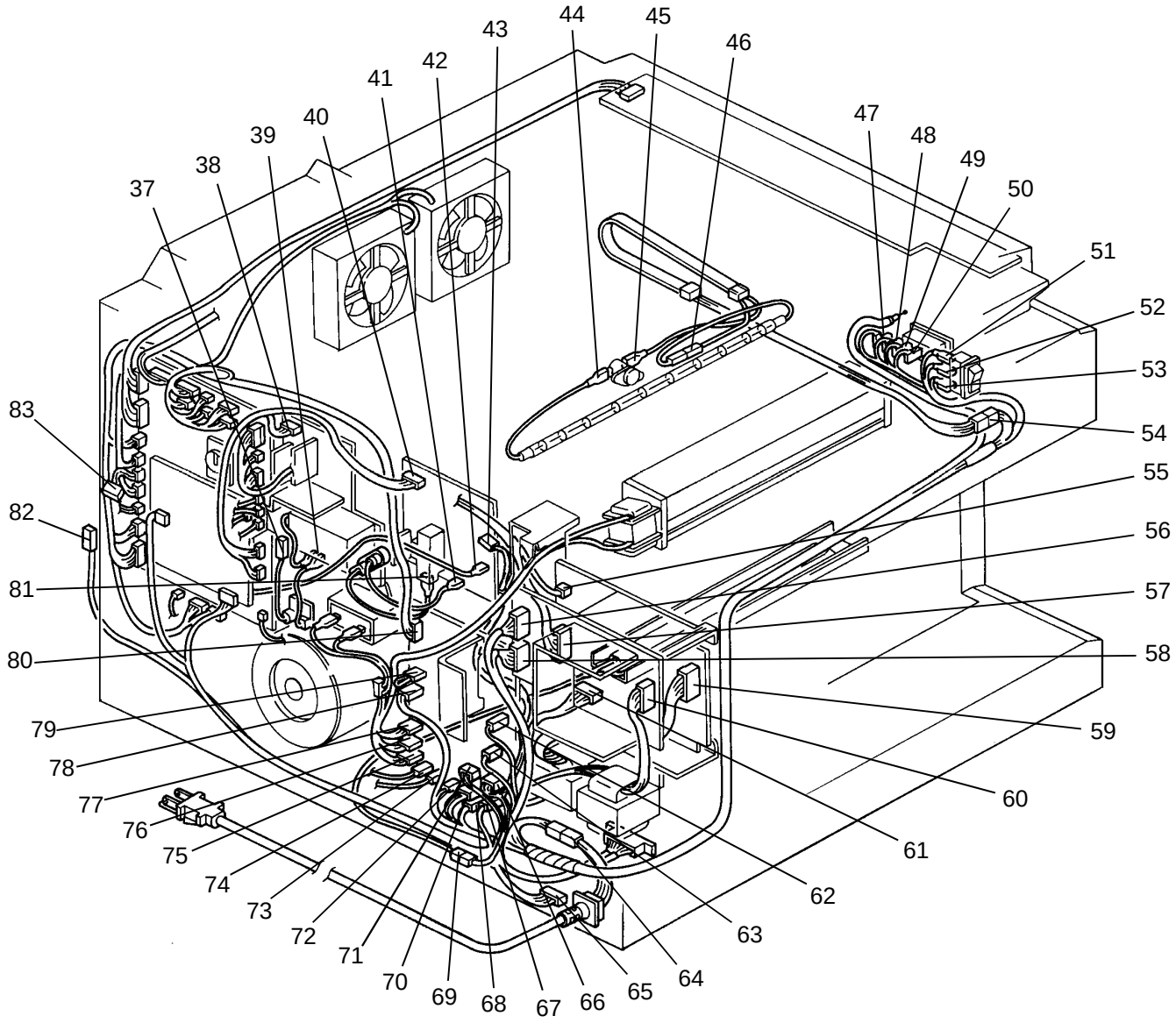
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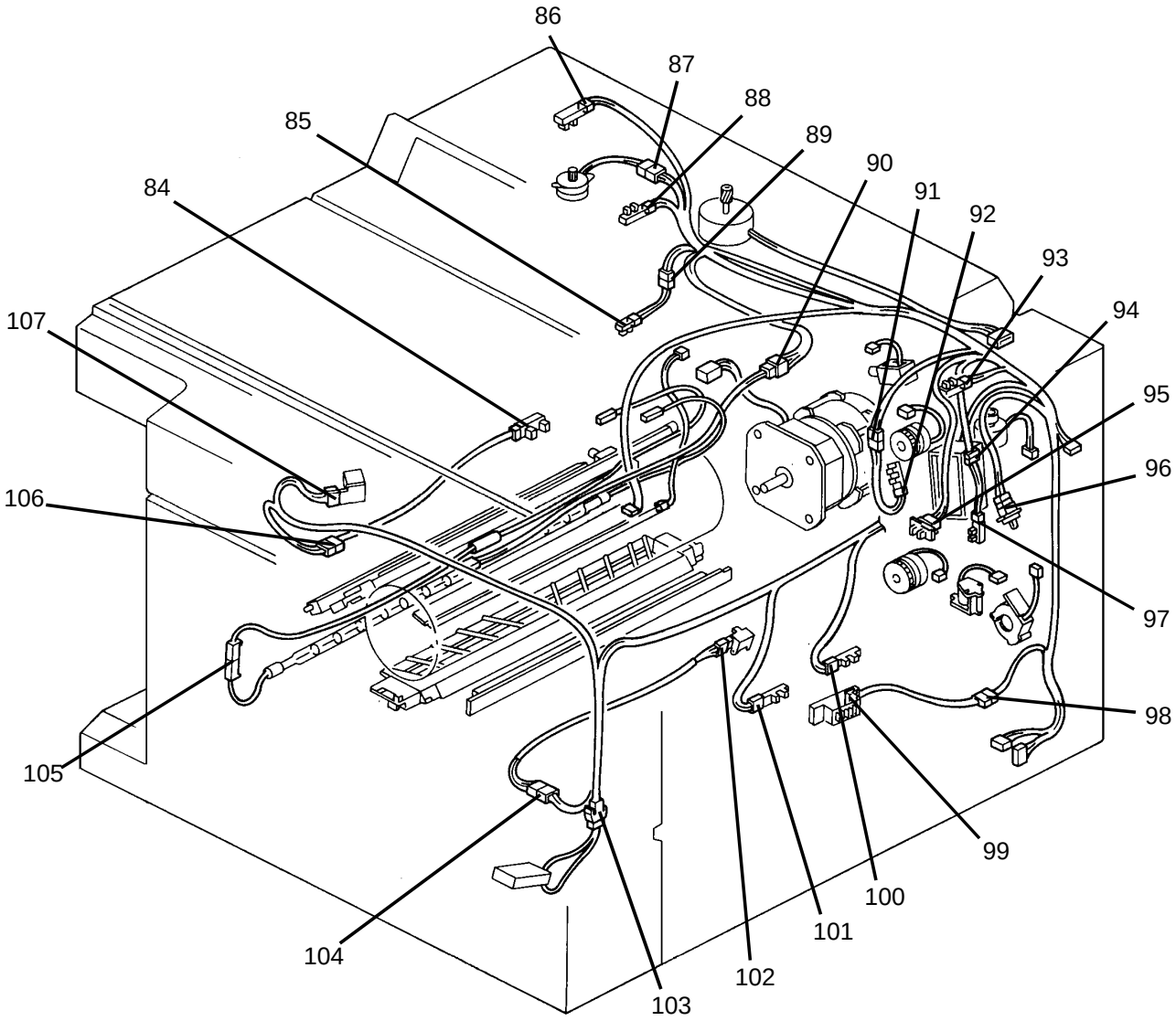
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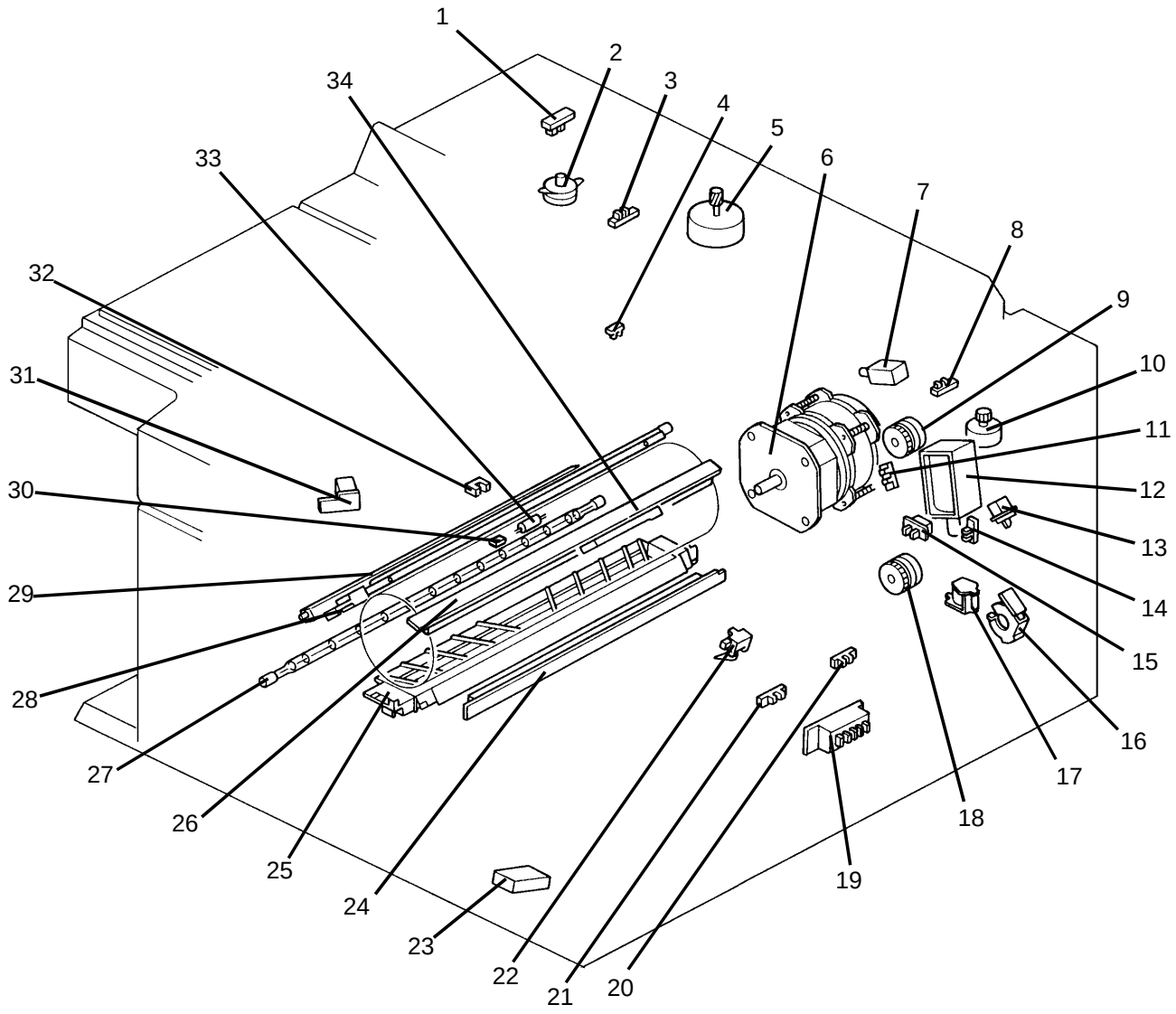
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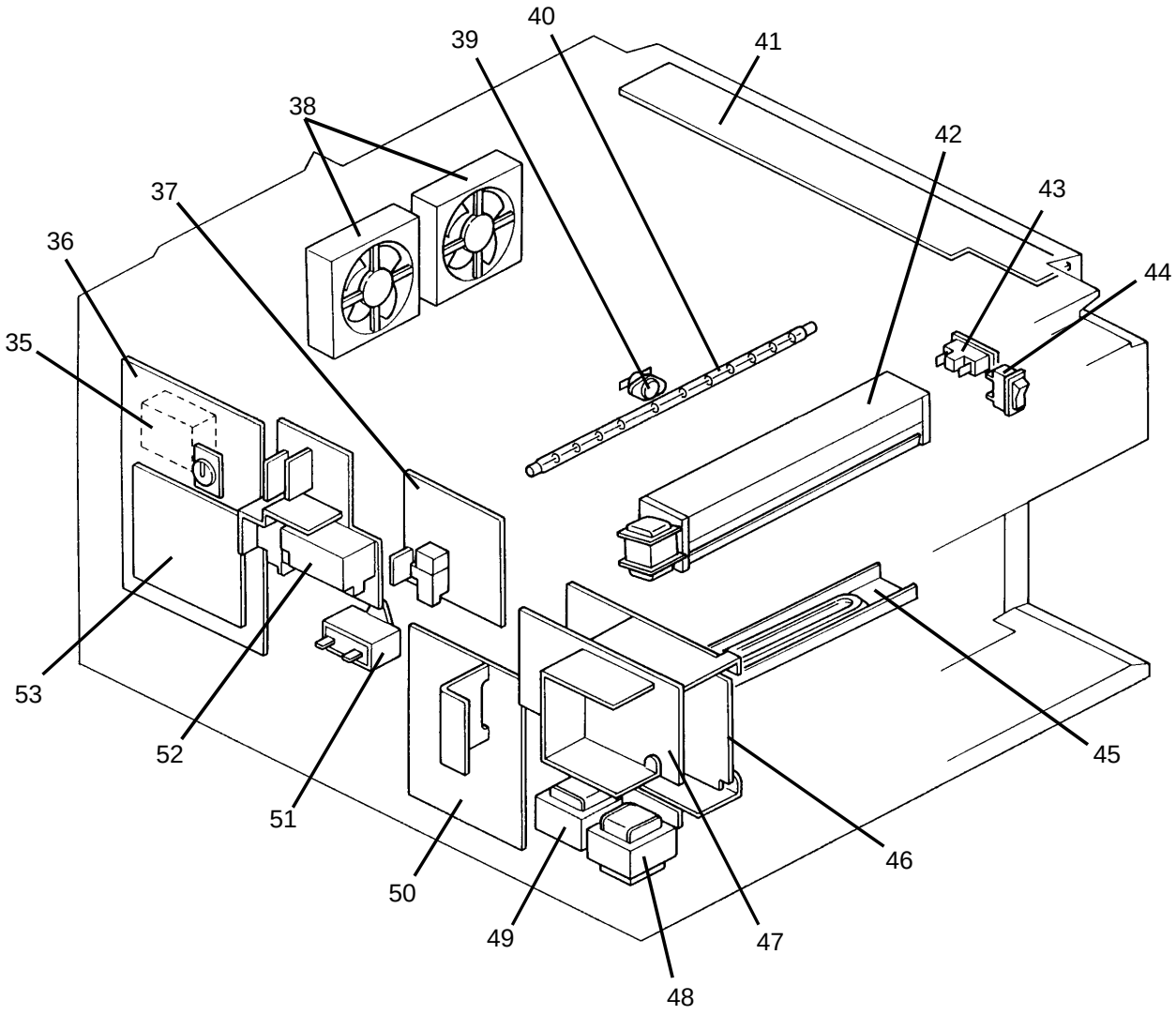
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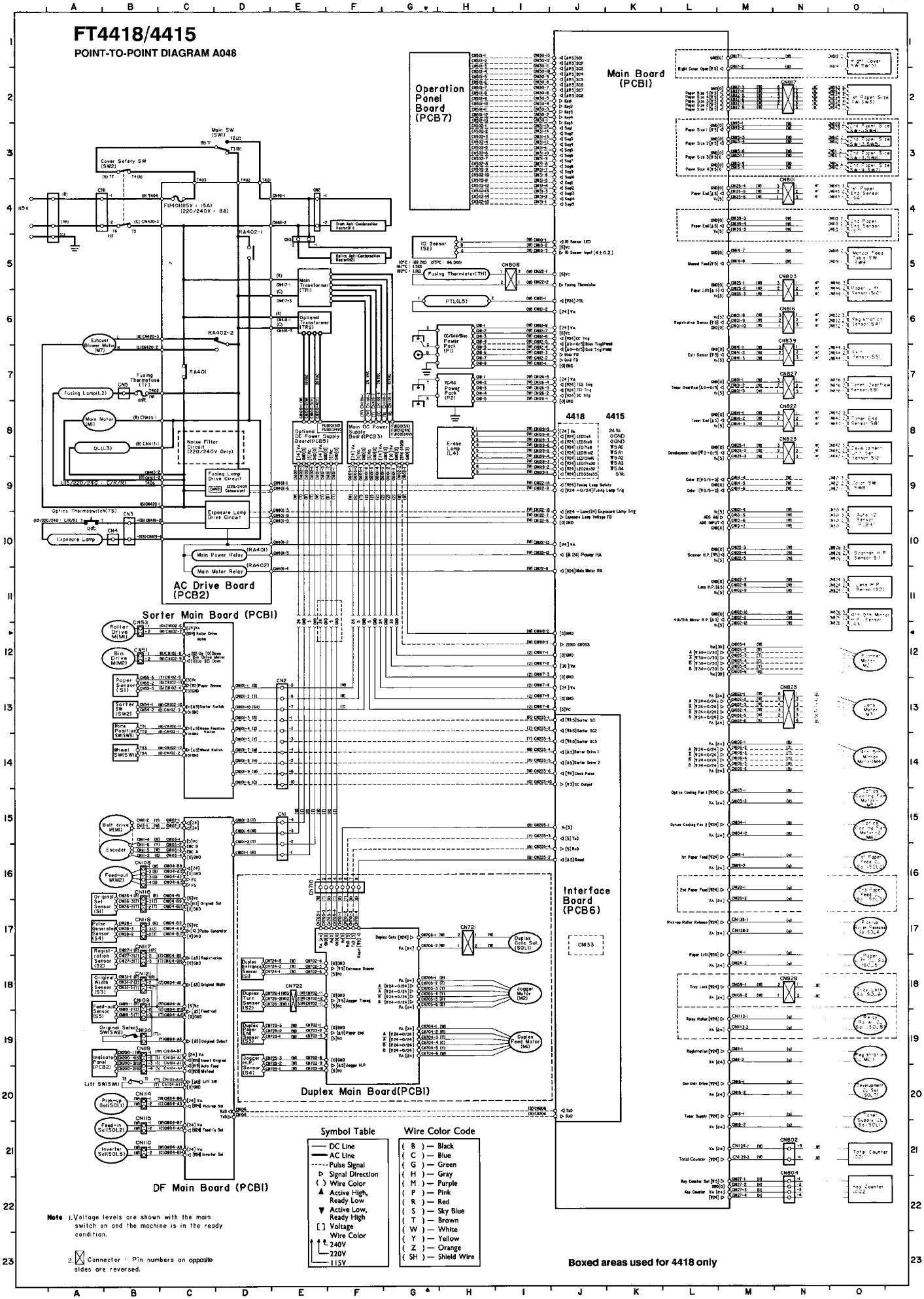
FT4418/4415

POINT-TO-POINT DIAGRAM A048



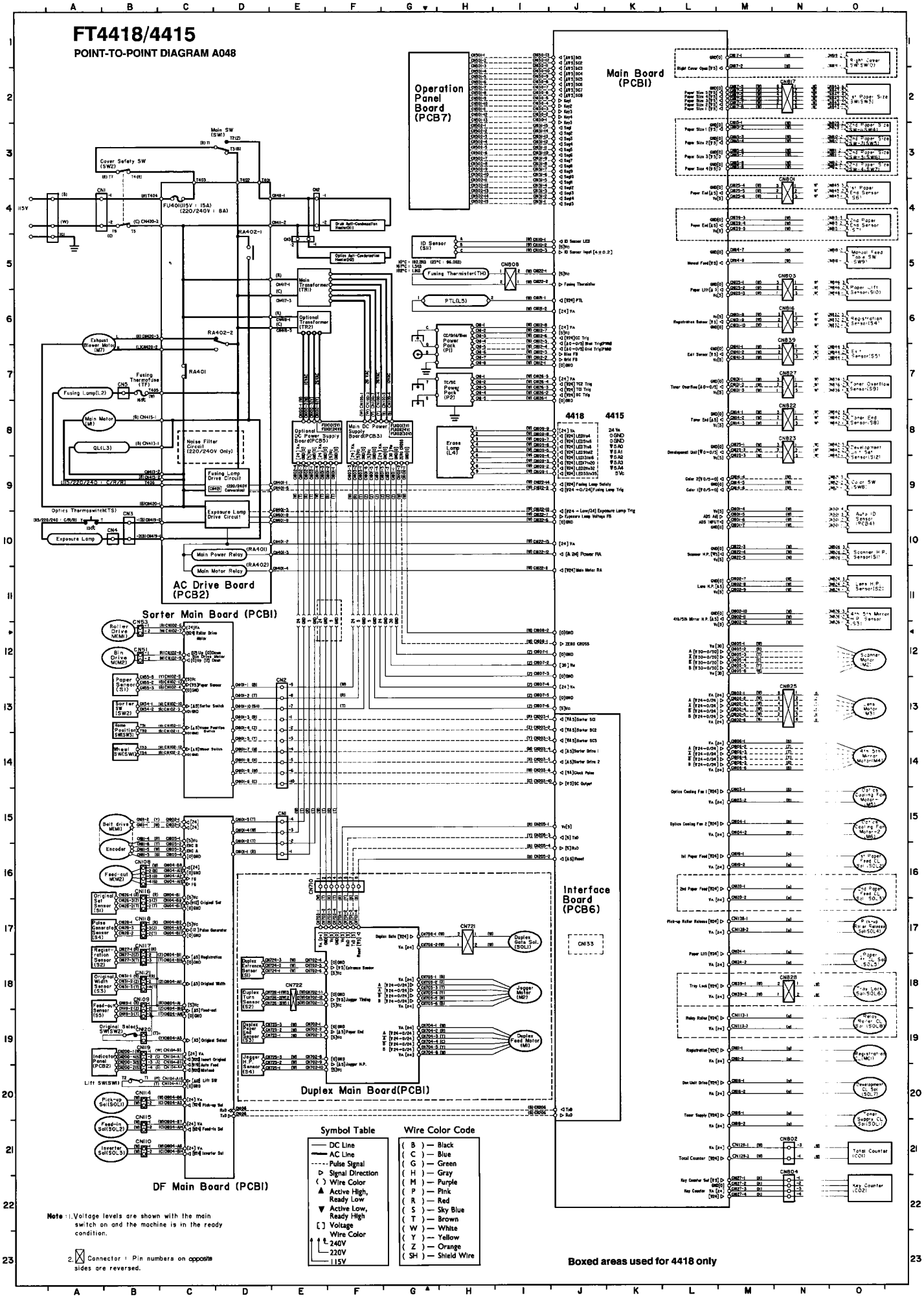
Note 1. Voltage levels are shown with the main switch on and the machine is in the ready condition.

2. ⊠ Connector : Pin numbers on opposite sides are reversed.

Boxed areas used for 4418 only

FT4418/4415

POINT-TO-POINT DIAGRAM A048



Note : 1. Voltage levels are shown with the main switch on and the machine is in the ready condition.

2. ☒ Connector : Pin numbers on opposite sides are reversed.

Boxed areas used for 4418 only

RICOH

RICOH FT4421 (A054)

PARTS CATALOG

First Edition December 1990

RICOH COMPANY, LTD.

PARTS CATALOG

INTRODUCTION

This chapter instructs you the numbers and names of these parts on this machine.

INDEX to PARTS CATALOG

FT4421 **(A054)**
AD120 **(A491)**
CS110 **(A490)**
DF57 **(A318)**

FT4421 (A054)

PARTS CATALOG

INTRODUCTION

This chapter instructs you the numbers and names of these parts on this machine.

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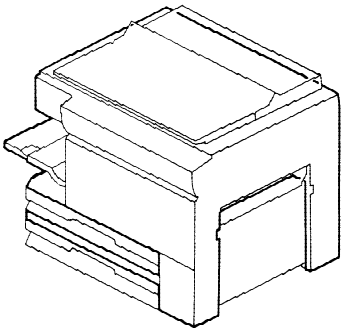

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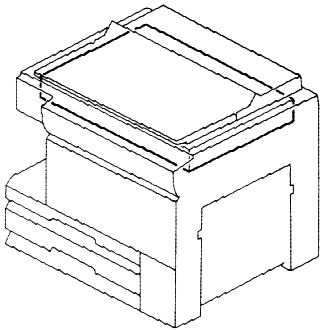

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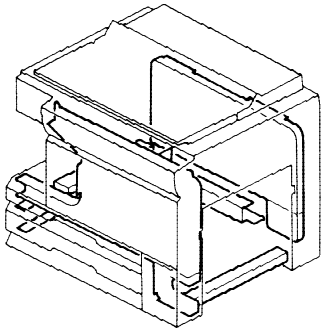

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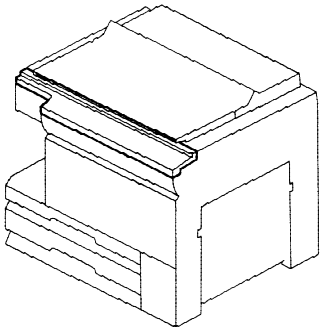

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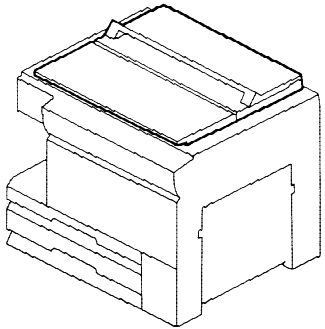

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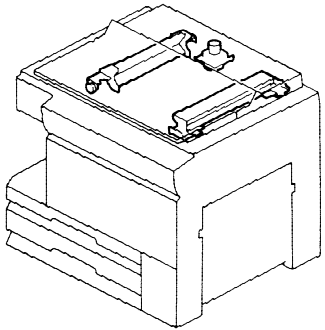

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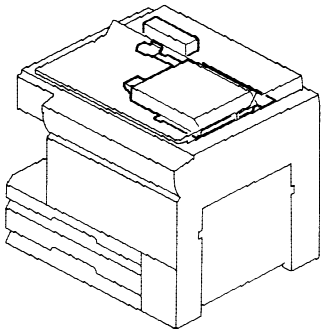

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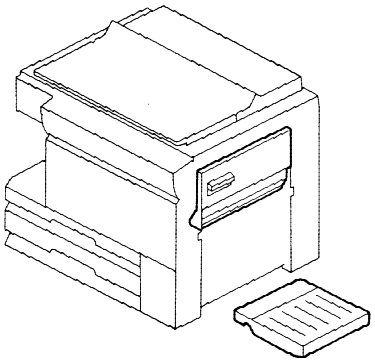

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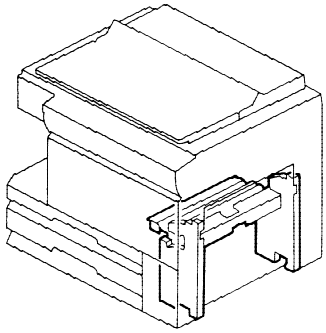

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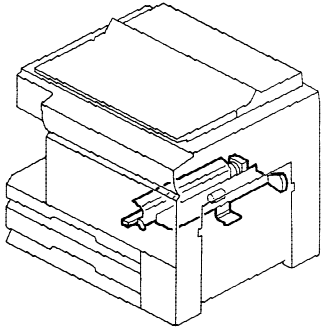

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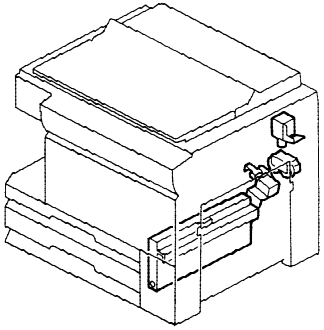

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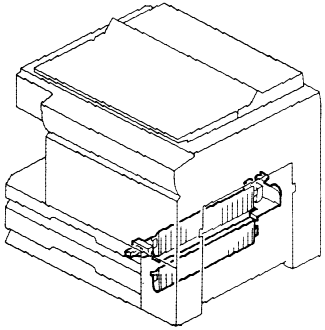

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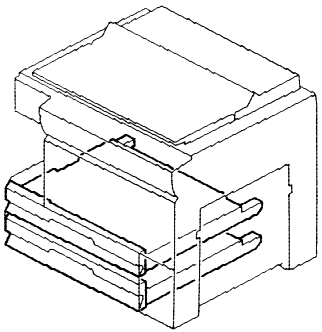

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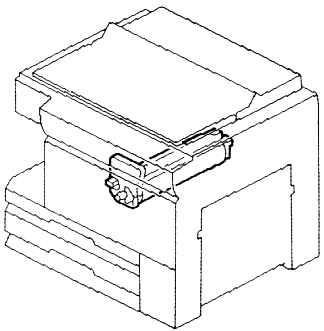

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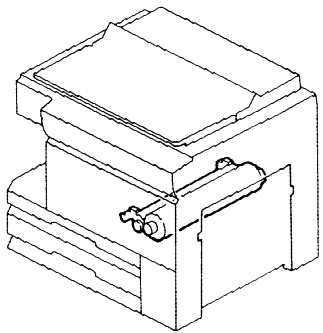

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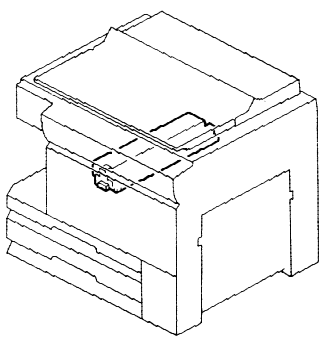

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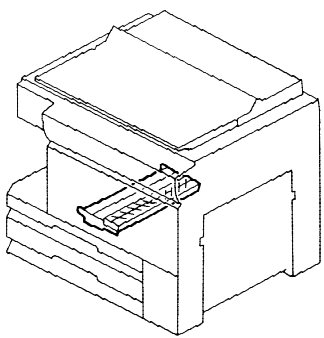

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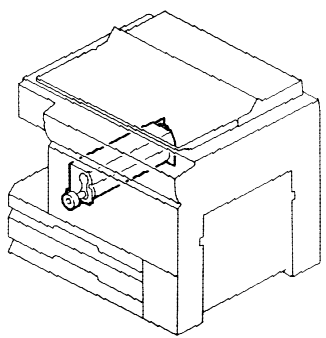

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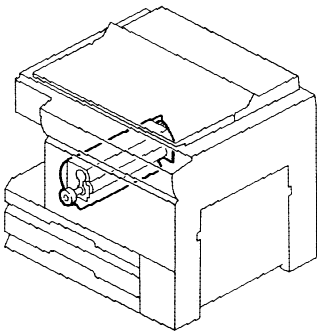

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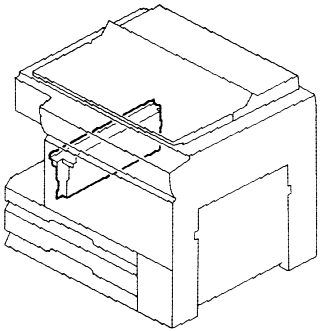

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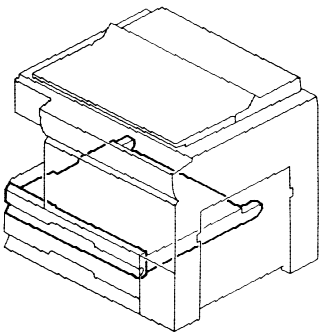

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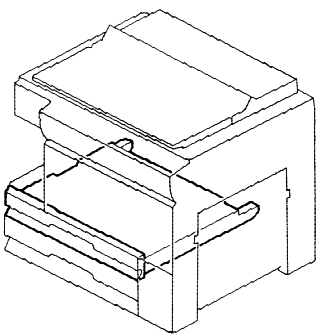

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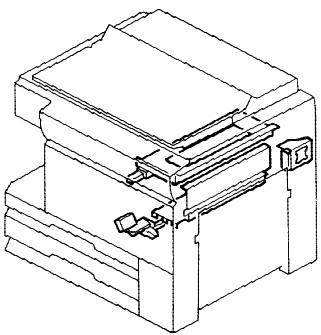

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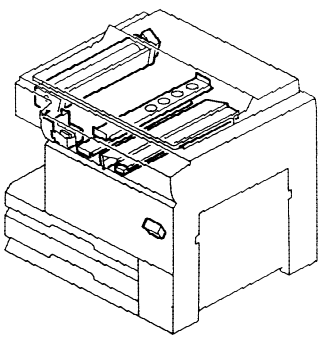

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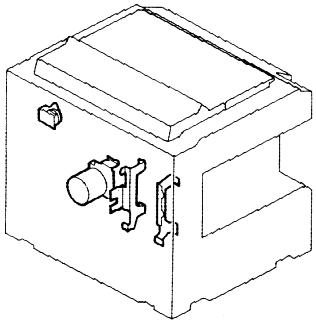

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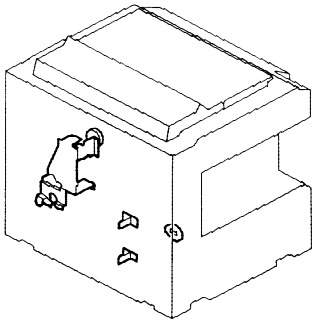

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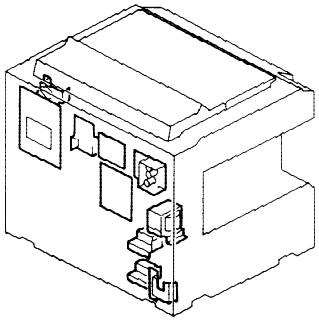

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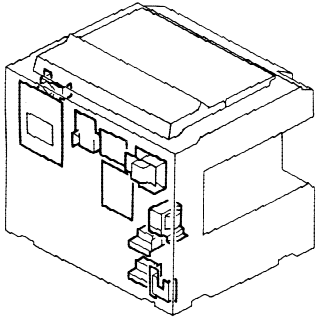

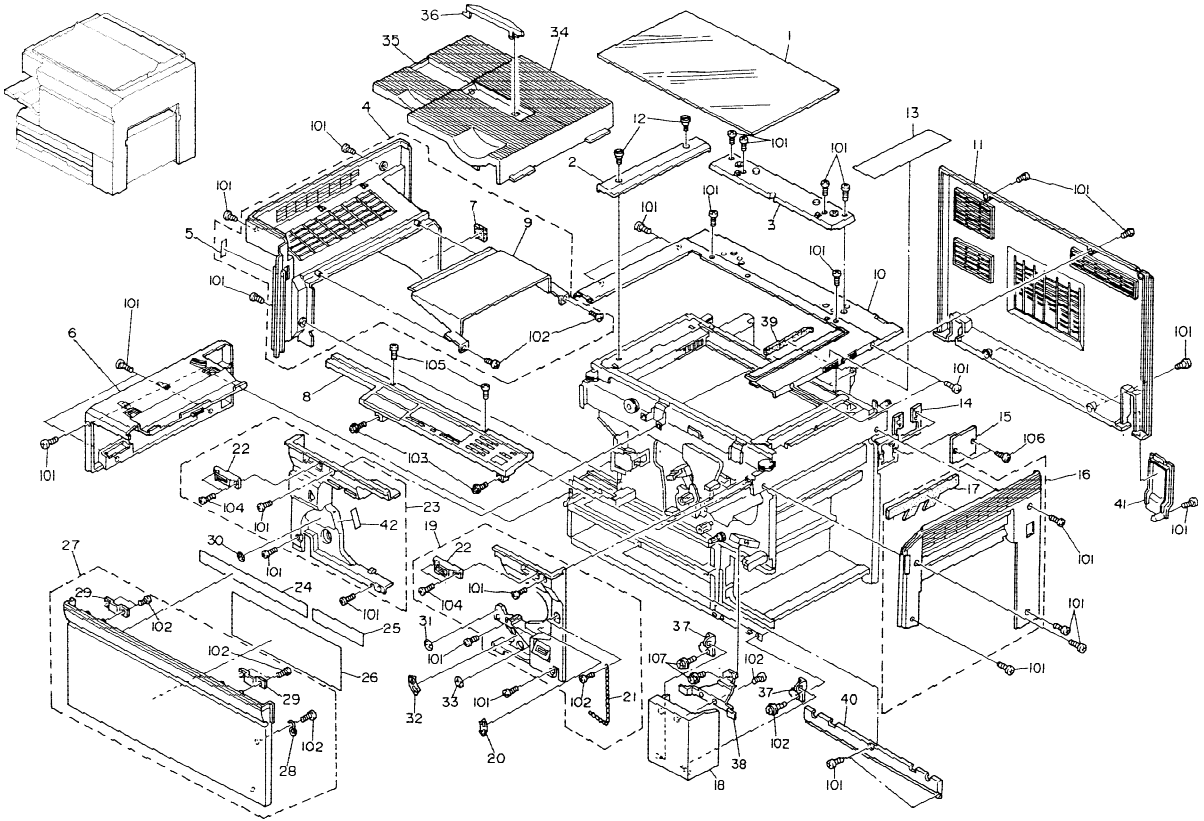
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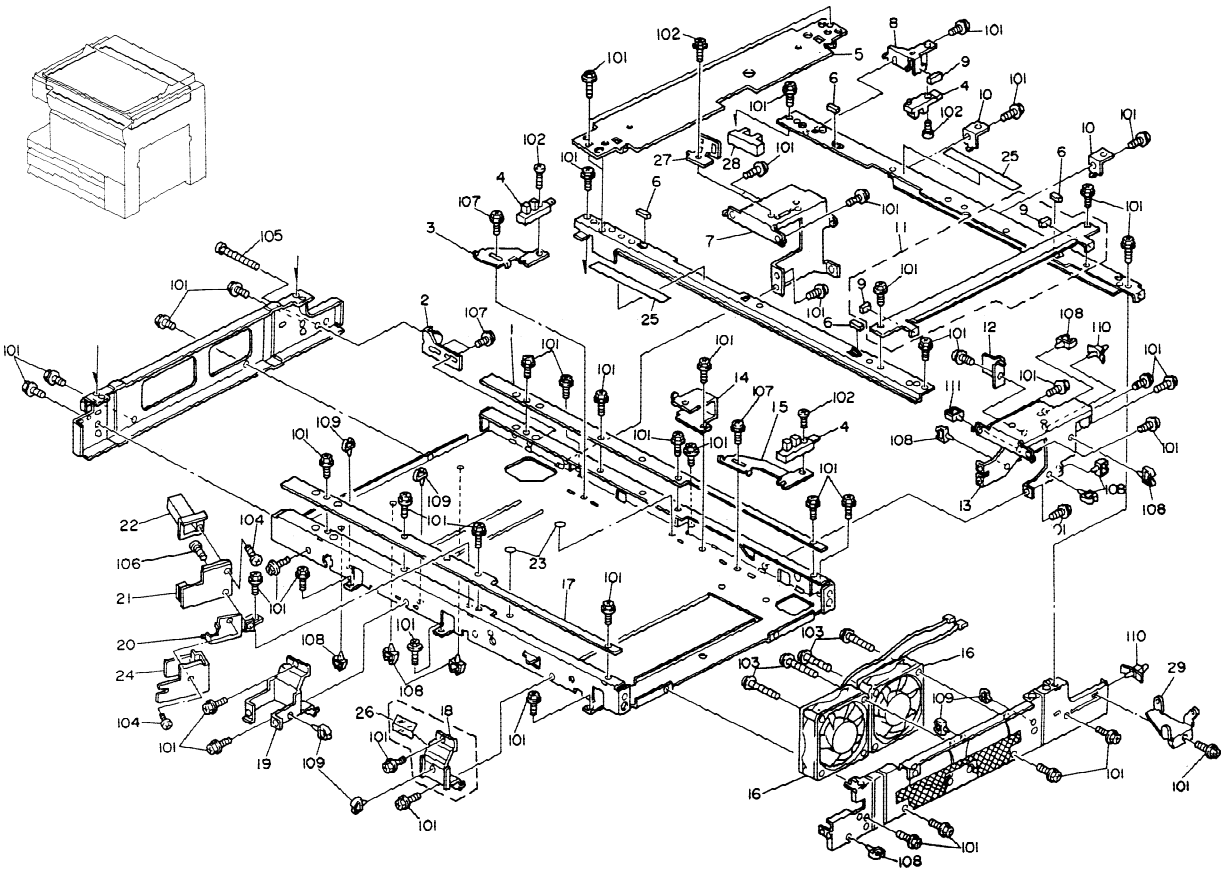
1. EXTERIOR I (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	5215 1980	Exposure Glass	1
2	AC04 1041	Left Original Scale - LT	1
2	AC04 1042	Left Original Scale - A4	1
3	A054 1885	Original Holder	1
4	A048 1259	Left Cover	1
5	A048 1367	Decal - Switch	1
6	A054 1273	Lower Left Cover	1
7	A048 1383	Left Cover Pad	1
8	A054 5550	Operation Panel Ass'y - LT	1
8	A054 5650	Operation Panel Ass'y - A4	1
9	A048 1384	Left Cover Guide	1
10	A054 1347	Upper Cover	1
11	A054 1313	Rear Cover	1
12	AA14 3070	Shoulder Screw - M2x2	5
13	A048 1366	Decal - Operating Instruction - LT	1
13	A048 1386	Decal - Operating Instruction - A4	1
14	5420 1515	Plate - Key Counter	1
15	A006 1352	Key Counter Cover	1
16	A054 1277	Right Cover	1
17	A048 1380	Filter - Right Cover	1
18	A054 1323	Front Tray Cover	1
19	A048 1334	Right Inner Cover	1
20	A048 1369	Decal - Toner Cartridge Lock	1
21	A017 1286	Front Cover Chain	1
22	AG07 0004	Magnet Catch Ass'y	2
23	A048 1332	Left Inner Cover - 220V	1
23	A048 1338	Left Inner Cover - 115V	1
24	A048 1364	Decal - Toner Casing	1
25	A048 1365	Decal - Development Unit	1
26	A054 1363	Decal - Misfeed Removal	1
26	A027 4867	Decal - Operation	1
27	A054 1232	Front Cover	1
28	A017 1288	Hook	1
29	A017 1285	Magnet Plate	2
30	A048 1361	Decal - D1	1
31	A048 1360	Decal - C2	1
32	A048 1358	Decal - B	1
33	A048 1357	Decal - A2	1
34	A048 4450	Copy Tray - Base	1
35	A048 4460	Copy Tray - Slide	1
36	A048 4470	Copy Tray - Guide	1
37	A054 1385	Front Cover Bracket - 3rd Feed	2
38	A054 1391	Front Cover Fixing Bracket	1
39	A048 1381	Filter - Upper Cover	1
40	A054 1352	Front Cover - 2nd Feed	1
41	A054 1268	Rear Harness Cover	1
42	5214 4972	Caution Decal - High Temperature - 115V	1
42	5214 4970	Caution Decal - High Temperature - 220/240V	1
101	0353 0060F	Philips Truss Head Screw - M3x6	
102	0413 0082W	Tapping Screw - M3x8	
103	0344 0060W	Philips Truss Head Screw - M4x6	
104	0802 5085	Tapping Screw - M4x8	
105	0344 0060D	Philips Truss Head Screw - M4x6	
106	0323 0060W	Philips Sunken Head Screw - M3x6	
107	0433 0060W	Hexagon Head Tapping Screw - M3x6	

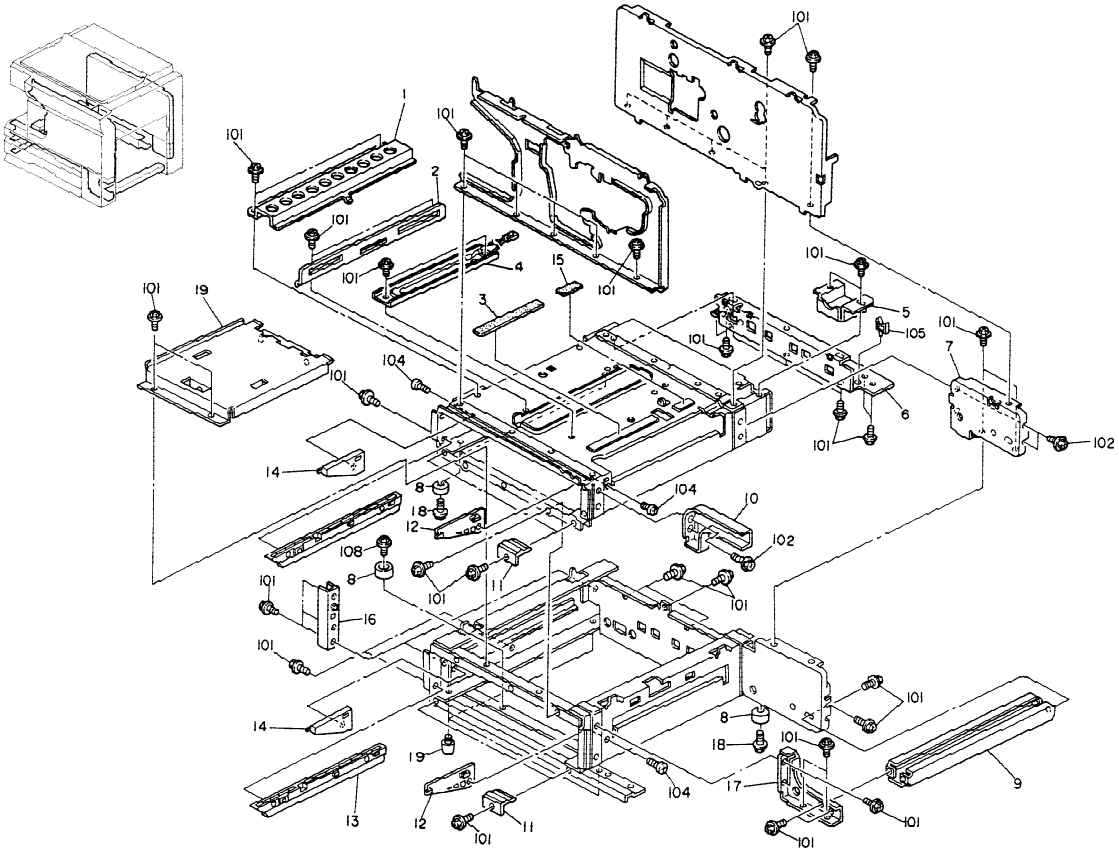


2. EXTERIOR II (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 1817	Rear Scanner Slide Rail	1
2	A006 1745	Wire Adjusting Plate	1
3	A048 1784	Lens Sensor Bracket	1
4	AW02 0022	Photointerruptor	1
5	A048 1840	Scale Bracket	1
6	5215 1924	Cushion	4
7	A054 1835	Left Bracket - Platen Cover	1
8	A048 1739	Photointerruptor Bracket	1
9	5205 1768	Rubber Seal - Mirror	3
10	A048 1836	Platen Cover Bracket	2
11	A048 1841	Right Contact Stay	1
12	A048 1833	Upper Bracket	1
13	A054 1834	Right Bracket - Platen Cover	1
14	A048 1792	Lens Cover Bracket	1
15	A048 1786	Sensor Drive Bracket	1
16	AX64 0020	Fan Motor - DC24V 5.5W	2
17	A048 1818	Front Scanner Slide Rail	1
18	A048 1837	Right Guide Bracket	1
19	A048 1839	Left Guide Bracket	1
20	A048 1776	Bracket - ADS Sensor	1
21	A048 5110	Optics Control Board	1
22	A048 1777	Cover - ADS Sensor	1
23	5205 1853	Mylar Seal - Base	5
24	A048 1779	2nd Cover - ADS	1
25	AA15 0029	Seal - 0.2x15x140	2
26	A048 1843	Seal	1
27	A054 1844	Positioning Sensor Bracket	1
28	AW02 0021	Photointerruptor	1
29	A494 5803	Bracket - DF Power Supply Cord	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0314 0100W	Philips Pan Head Screw - M4x10	
103	0951 3030W	Philips Screw with Flat Washer - M3x30	
104	0413 0082W	Tapping Screw - M3x8	
105	0314 0250W	Philips Pan Head Screw - M4x25	
106	0313 0060W	Philips Pan Head Screw - M3x6	
107	0951 4008W	Philips Screw with Flat Washer - M4x8	
108	1105 0230	Clamp	
109	1105 0199	Clamp	
110	1105 0159	PCB Stud	
111	1105 0231	Clamp	
112	0313 0040W	Philips Pan Head Screw - M3x4	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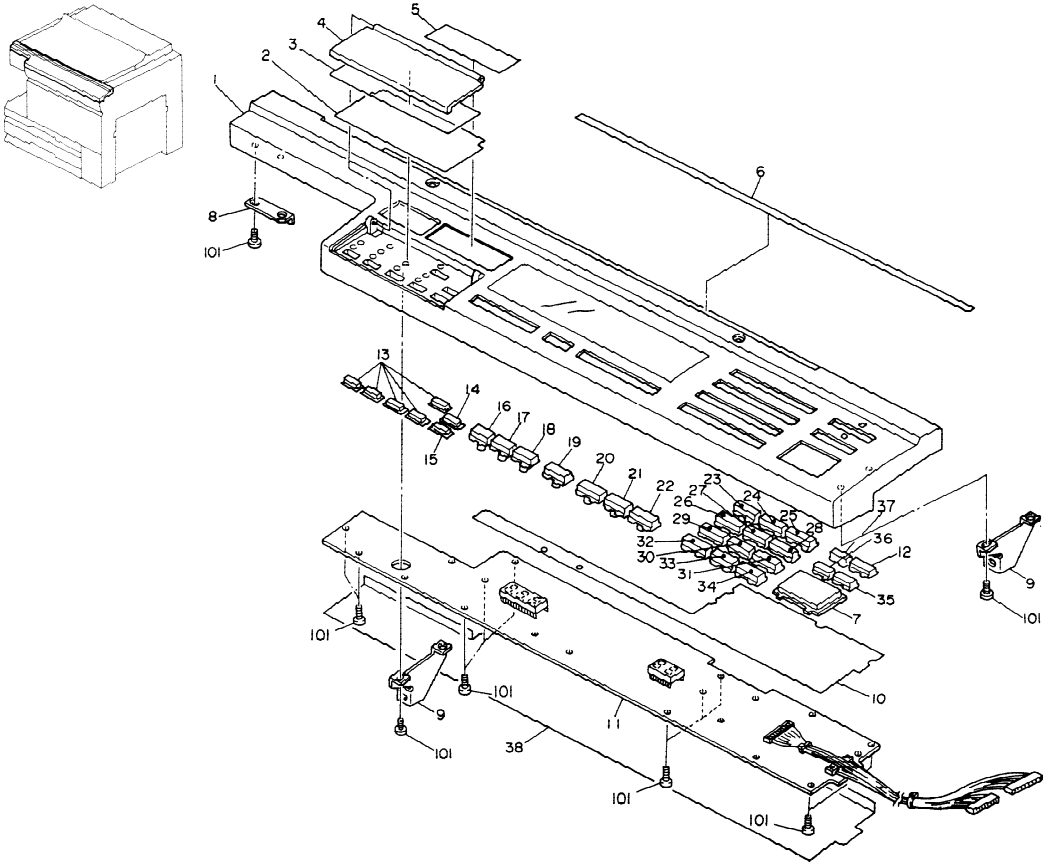
3. EXTERIOR III (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 1064	Support Plate	1
2	A048 1065	Copy Tray Bracket	1
3	A048 3865	Cushion - 3x18x150mm	1
4	AX40 0021	Anti-Condensation Heater - 115V 18W	1
5	A048 1056	Base Cover	1
6	A054 1060	Size Sensor Bracket - 2nd Feed	1
7	A054 1062	Rear Support Bracket - 2nd Feed	1
8	A312 2600	Foot	5
9	A048 2698	Lower Paper Feed Stay	1
10	A054 1061	Front Support Bracket - 2nd Feed	1
11	A048 2850	Paper Tray Stopper	2
12	A048 2851	Right Guide	1
13	A048 2853	Paper Tray Rail	1
14	A048 2852	Left Guide	1
15	A048 3864	Seal - 18x60x4	1
16	A054 1179	Left Support Bracket - 3rd Feed	2
17	A054 1176	Front Support Bracket - 3rd feed	1
18	5403 2075	Stepped Screw	5
19	A054 1186	Upper Supporting Plate	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0951 4005W	Philips Screw with Flat Washer - M4x5	
103	0951 3010W	Philips Screw with Flat Washer - M3x10	
104	0413 0082W	Tapping Screw - M3x8	
105	1105 0199	Clamp	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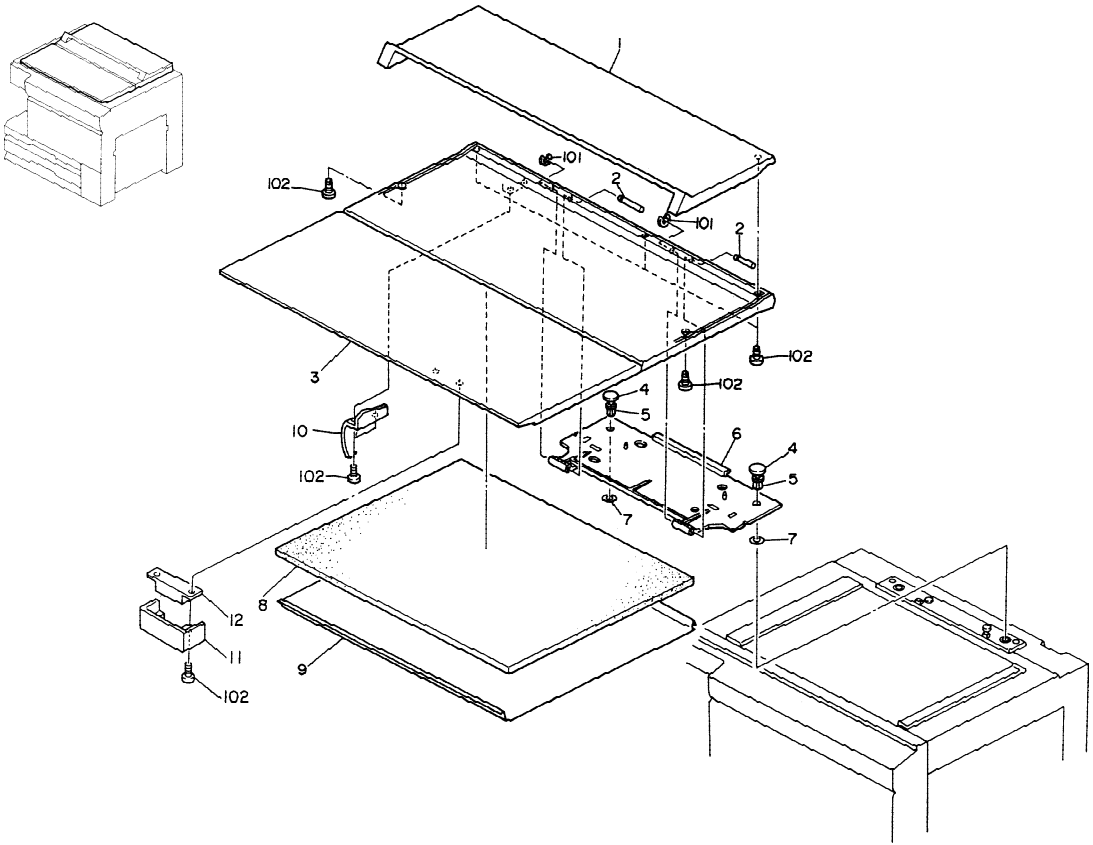
4. OPERATION PANEL (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A054 5550	Operation Panel Ass'y - LT	1
*	A054 5650	Operation Panel Ass'y - A4	1
1	A054 1453	Operation Panel Cover - A4	1
1	A054 1452	Operation Panel Cover - LT	1
2	A048 1490	Sheet Operation Panel - LT	1
2	A048 1495	Sheet - Operation Panel - A4	1
3	A048 1492	Decal - Enter - LT	1
4	A048 1454	Key Top Cover	1
5	A048 1491	Decal - Size Magnification - LT	1
5	A048 1496	Decal - Size Magnification - A4	1
6	A048 1493	Decal - Size Scale - LT	1
6	A048 1498	Decal - Size Scale - A4	1
7	A048 1456	Key Top - Start	1
8	A048 5810	Left Operation Panel Bracket	1
9	A048 5812	Right Operation Panel Bracket	2
10	A048 1501	Mylar Sheet	1
11	A054 1500	Operation Panel Board - LT	1
11	A054 1503	Operation Panel Board - A4	1
12	A048 1457	Key Top - Clear Mode	1
13	A048 1481	Key Top	5
14	A048 1479	Key Top - Zoom Up	1
15	A048 1480	Key Top - Zoom Down	1
16	A048 1478	Key Top - Reduce	1
17	A048 1477	Key Top - Enlarge	1
18	A048 1476	Key Top - Full Size	1
19	A048 1475	Key Top - Paper Selection	1
20	A048 1474	Key Top Lighter	1
21	A048 1473	Key Top - Darker	1
22	A048 1472	Key Top - ADS	1
23	A048 1461	Key Top - 1	1
24	A048 1462	Key Top - 2	1
25	A048 1463	Key Top - 3	1
26	A048 1464	Key Top - 4	1
27	A048 1465	Key Top - 5	1
28	A048 1466	Key Top - 6	1
29	A048 1467	Key Top - 7	1
30	A048 1468	Key Top - 8	1
31	A048 1469	Key Top - 9	1
32	A048 1470	Key Top - 0	1
33	A048 1471	Key Top - Point	1
34	A048 1460	Key Top - C/S	1
35	A048 1458	Key Top - Interrupt	1
36	A048 1459	Key Top - Enter	1
37	A054 1482	Key Top - Program	1
38	A048 1499	Insulating Mylar	1
101	0413 0082W	Tapping Screw - M3x8	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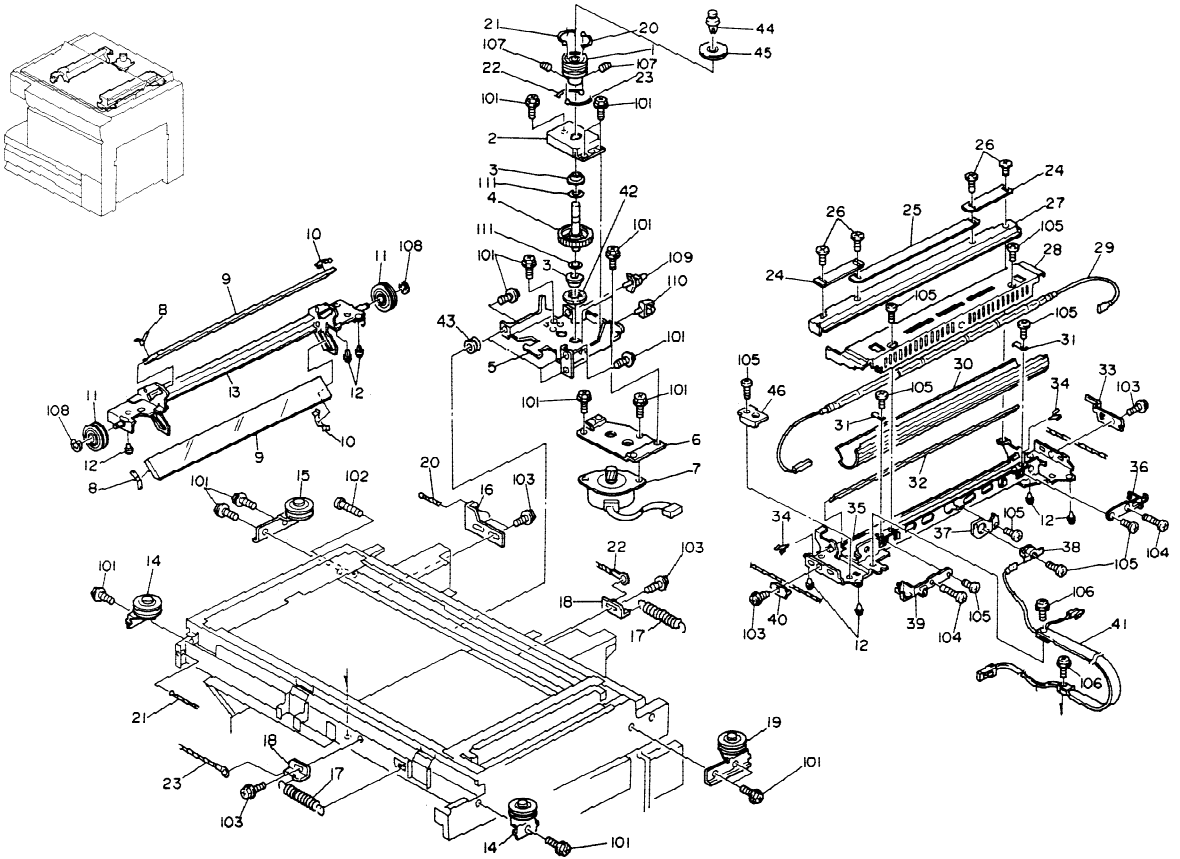
5. PLATEN COVER (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A054 1695	Platen Cover Ass'y	1
1	A027 1365	Original Holder	1
2	5216 1374	Hinge Shaft - Platen Cover	2
3	A054 1881	Platen Cover	1
4	5216 1373	Ratch - Plunger	2
5	5216 1372	Ratch - Grommet	2
6	A017 1924	Flex Hinge - Platen Cover	1
7	5203 1359	Platen Cover Washer	2
8	A027 1368	Platen Cover Pad	1
9	A027 9500	Platen Cover Sheet - 10 Sheets/Set	1
10	A054 1888	Platen Cover Sensor Actuator	1
11	A054 1887	Magnet Sensor Holder	1
12	5446 2080	Magnet Sensor	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0720 0025E	Retaining Ring - M2.5	
102	0413 0082W	Tapping Screw - M3x8	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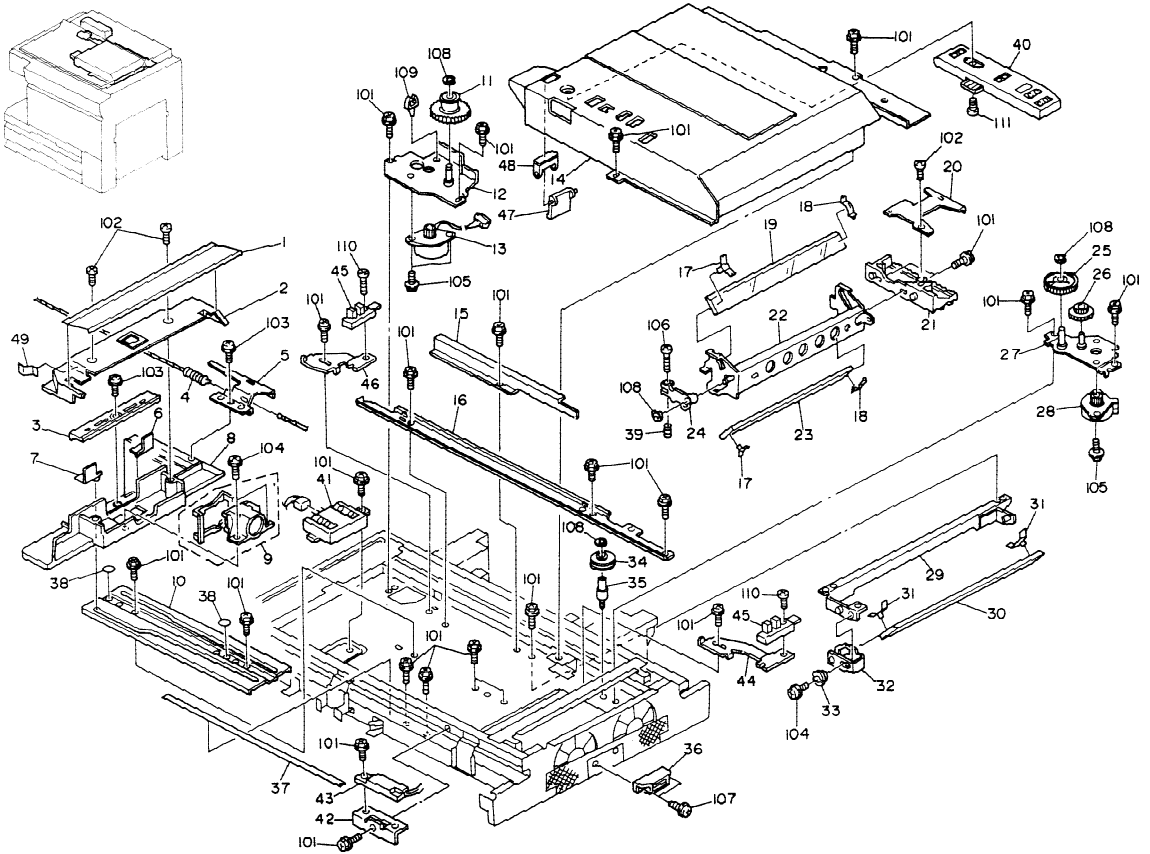
6. OPTICS I (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 1870	Scanner Motor Pulley	1
2	A048 1740	Upper Scanner Motor Bracket	1
3	AA08 2029	Bushing - 6x13x5	2
4	AB01 0042	Gear - 69Z	1
5	A048 1742	Middle Scanner Motor Bracket	1
6	A048 1744	Lower Scanner Motor Bracket	1
7	A048 5214	Scanner Drive Motor - DC30V	1
8	A006 1721	Front Spring Plate	4
9	AC03 0019	2nd & 3rd Mirror	2
10	A006 1724	Rear Spring Plate	4
11	AB03 2024	Pulley - Scanner Wire	2
12	A006 1705	Scanner Shoe	7
13	A048 1714	2nd Scanner	1
14	A048 1737	Front Wire Pulley	2
15	A048 1733	Left Rear Wire Pulley	1
16	A006 1745	Wire Adjusting Plate	1
17	A006 1744	Wire Support Plate	2
18	AA06 0250	Spring - Scanner Drive Wire	2
19	A048 1731	Rear Wire Pulley	1
20	AA05 0043	Scanner Drive Wire - 1462mm	1
21	AA05 0042	Scanner Drive Wire - 1807mm	1
22	AA05 0045	Scanner Drive Wire - 1011mm	1
23	AA05 0044	Scanner Drive Wire - 1458mm	1
24	A027 1769	Exposure Adjusting Plate - Side	2
25	A027 1768	Exposure Adjusting Plate - Center	1
26	5442 1702	Small Screw - M3	4
27	A048 1706	Reflector	1
28	A048 1710	Reflector Cover	1
29	AX53 0006	Exposure Lamp - 97V 300W	1
29	AX53 0007	Exposure Lamp - 180V 330W	1
30	5205 1696	Main Reflector	1
31	5409 1705	Clamp - Reflector	2
32	5442 1710	1St Mirror	1
33	A006 1707	Rear Wire Clamp	1
34	A048 1721	Spring Plate A	2
35	A048 1701	1st Scanner	1
36	A048 1725	Rear Lamp Holder	1
37	A048 1709	Thermostat Holder	1
38	AW11 0011	Thermostat 140;C AC120V 15A	1
39	A048 1726	Front Lamp Holder	1
40	A006 1708	Front Wire Clamp	1
41	A048 5370	Exposure Lamp Harness	1
42	A048 1746	Spacer - 11x17x1.5	1
43	AA16 1067	Cushion - Motor	3
44	A048 1745	Patch - Planger & Grommet	1
45	A048 1747	Disk - 50mm	1
46	A054 1705	1st Scanner Stopper	1
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0314 0250W	Philips Pan Head Screw - M4x25	
103	0951 4008W	Philips Screw with Flat Washer - M4x8	
104	0313 0100W	Philips Pan Head Screw - M3x10	
105	0313 0040W	Philips Pan Head Screw - M3x4	
106	0951 3012W	Philips Screw with Flat Washer - M3x1	
107	0754 0050E	Hexagon Headless Set Screw - M4x5	
108	0720 0050E	Retaining Ring - M5	
109	1105 0159	PCB Stud	
110	1105 0230	Clamp	
111	0807 4127	Wave Washer	

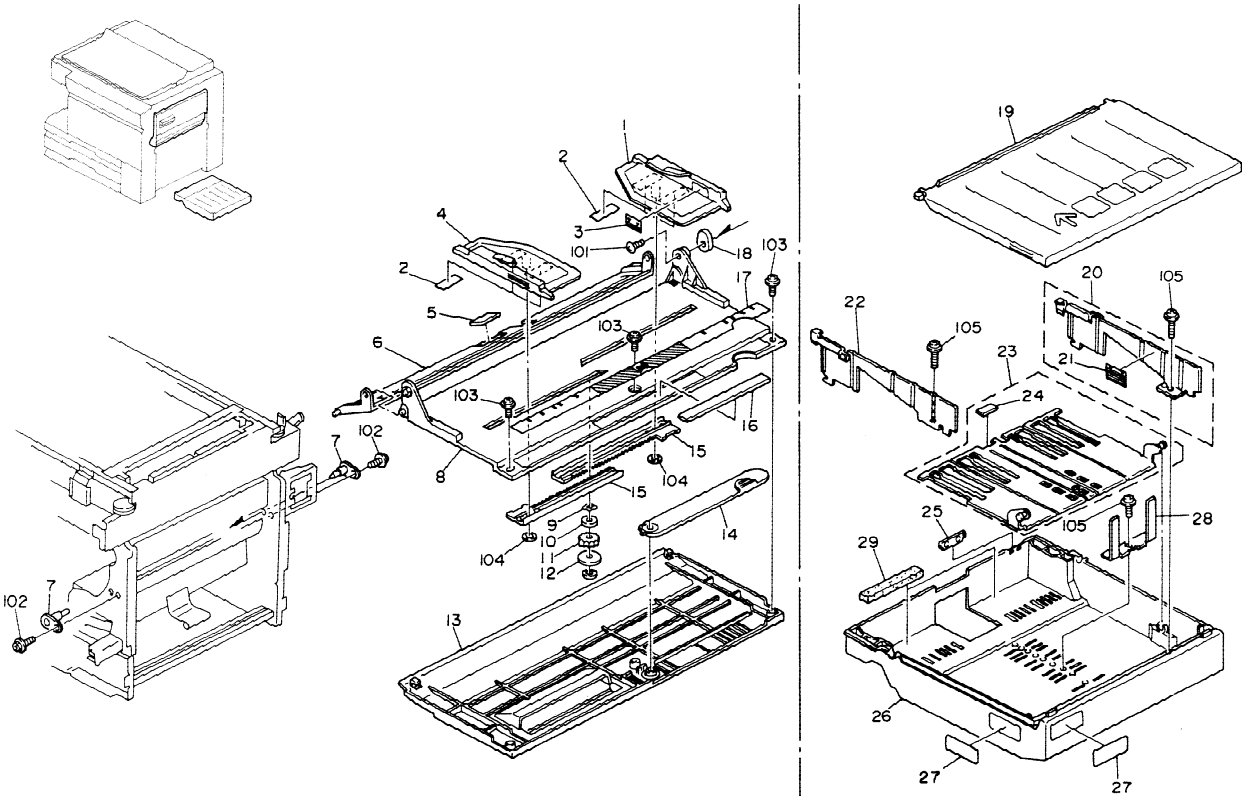


7. OPTICS II (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A054 1753	Large Lens Shielding Seal	1
2	A054 1754	Lens Shielding Cover	1
3	A048 1775	Shielding Guide Plate	1
4	AA05 0046	Lens Drive Wire	1
5	A048 1755	Lens Shutter	1
6	A048 1771	Rear Shielding Plat	1
7	A048 1773	Front Shielding Plate	1
8	A048 1751	Lens Bracket	1
9	AC02 0058	Lens Ass'y - 8/180	1
10	A048 1788	Cam Plate - Lens Shield	1
11	5215 1812	Lens Drive Pulley	1
12	A048 1757	Lens Motor Bracket	1
13	A048 5239	Lens Motor - DC24V	1
14	A054 1789	Lens Cover	1
15	A048 1808	Rear Base Shielding Plate	1
16	A048 1807	Guide Plate - Lens Drive	1
17	A006 1721	Front Spring Plate	4
18	A006 1724	Rear Spring Plate	4
19	AC03 0026	Mirror - L224	1
20	A048 1782	Mirror Shutter	1
21	A048 1763	Rack Gear - Mirror Drive	1
22	A048 1761	Mirror Bracket	1
23	AC03 0021	5th Mirror	1
24	A027 1705	Mirror Guide	1
25	AB01 7129	Gear - 20Z and 72Z	1
26	AB00 0014	Gear - 48T	1
27	A048 1767	Mirror Motor Bracket	1
28	A048 5237	Mirror Motor - DC24V	1
29	A048 1793	6th Mirror Bracket	1
30	AC03 0025	Mirror - L298	1
31	A006 1722	Spring Plate	2
32	A048 1797	6th Mirror Adjusting Bracket	1
33	A006 1766	Adjusting Cam	1
34	5215 1806	Pulley	1
35	AA14 3264	Pully Shaft	1

Index No.	Part No.	Description	Q'ty per Assembly
36	AG07 0004	Magnet Catch Ass'y	2
37	AA15 0074	Seal - 12x272	1
38	5205 1853	Mylar Seal - Base	5
39	AA06 3012	Second Mirror Spring	1
40	AW40 0012	Original Length Sensor - LT	1
40	AW40 0011	Original Length Sensor - A4	1
41	AW40 0010	Original Width Sensor	1
42	A054 1845	DF Detecting Switch Bracket	1
43	AW20 0002	DF Detecting Switch	1
44	A048 1786	Sensor Drive Bracket	1
45	AW02 0022	Photointerruptor	2
46	A048 1784	Lens Sensor Bracket	1
47	A054 1811	Shielding Plate - Lower Sensor	1
48	A054 1810	Shielding Plate - Upper Sensor	1
49	A054 1756	Small Lens Shielding Seal	1
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0413 0082W	Tapping Screw - M3x8	
103	0951 3006W	Philips Screw With Flat Washer - M3x6	
104	0951 3008W	Philips Screw with Flat Washer - M3x8	
105	0313 0060W	Philips Pan Head Screw - M3x6	
106	0313 0140W	Philips Pan Head Screw - M3x14	
107	0951 3004W	Philips Screw with Flat Washer - M3	
108	0720 0040E	Retaining Ring - M4	
109	1105 0199	Clamp	
110	0314 0100W	Philips Pan Head Screw - M4x10	
111	0951 4008W	Philips Screw With Flat Washer - M4x8	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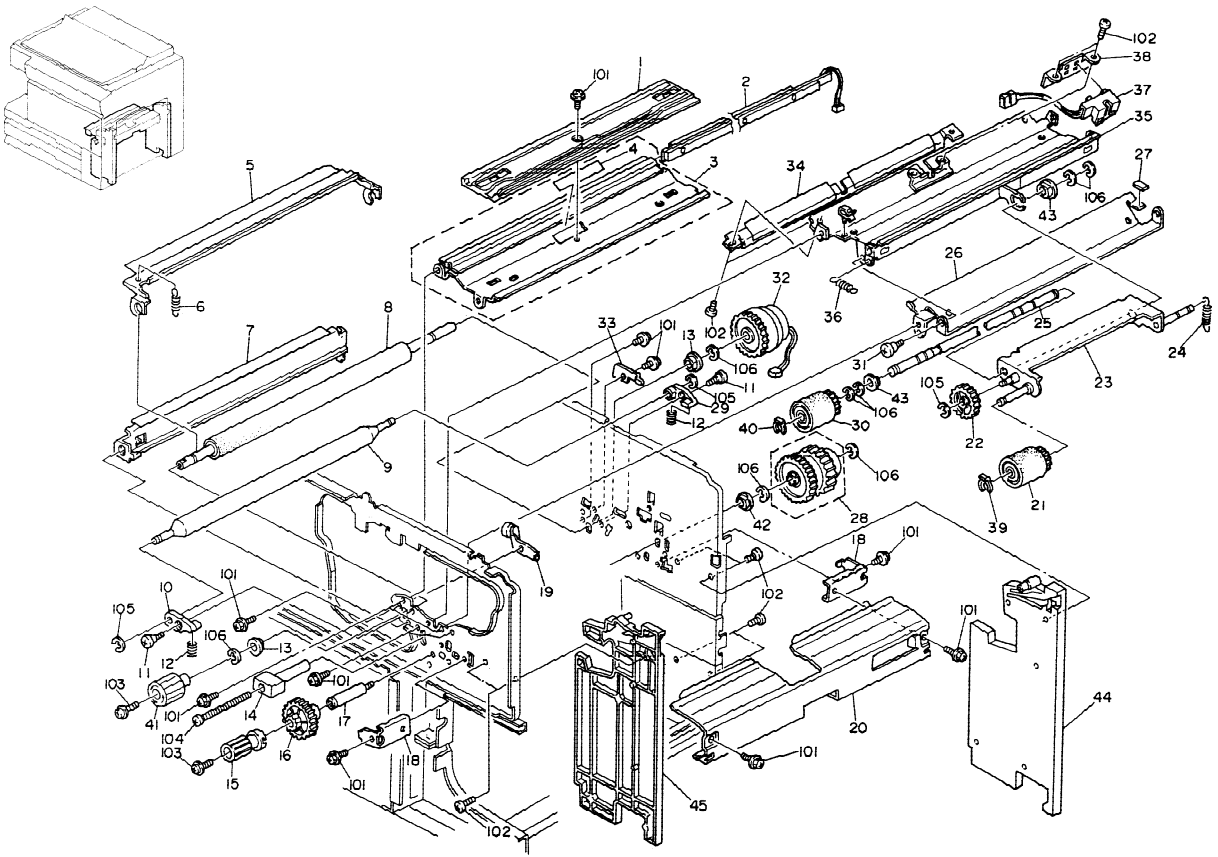
8. CASSETTE AND MANUAL FEED TABLE (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A048 2921	Manual Feed Table Ass'y - LT	1
*	A048 2922	Manual Feed Table Ass'y - A4	1
1	A006 2691	Rear Side Fence	1
2	AA15 0063	Side Fence Sheet	4
3	A048 2955	Decal - Manual Feed	1
4	A006 2681	Front Side Fence	1
5	5447 2927	Friction Pad - B	1
6	A048 2940	Manual Feed Guide	1
7	A048 2951	Front Guide Holder	2
8	A048 2946	Manual Feed Table	1
9	5443 2713	Wave Washer	1
10	5215 2691	Brake	1
11	5215 2687	Gear - 16T	2
12	A006 2699	Spacer - 5.1x20mm	2
13	A048 2945	Manual Feed Cover	1
14	A048 2938	Paper Guide - Manual Feed Table	1
15	A006 2698	Side Fence Gear	2
16	A048 2937	Fixed Plate - Manual Feed Table	1
17	A048 2947	Decal - Paper Size - LT	1
17	A048 2948	Decal - Paper Size - A4	1
18	A048 2928	Cam - Manual Feed Table	1
19	A008 2737	Small Cassette Cover	1
20	A048 2908	Rear Side Fence	1
21	AA00 2010	Decal - Paper Level	1
22	A048 2904	Front Side Fence	1
23	A048 2913	Bottom Plate	1
24	5215 2713	Bottom Plate Pad	1
25	5205 2979	Actuator - 11x8 1/2	1
25	5205 2996	Actuator - 8 1/2x11R	1
25	5205 2962	Actuator - A4R	1
25	5205 2964	Actuator - A4S	1
25	5205 2966	Actuator - A5R	1
25	5205 2967	Actuator - A5	1
25	5205 2979	Actuator - 11x8 1/2	1
25	5205 2993	Actuator - 8 1/2X5 1/2	1
25	5205 2992	Actuator - 5 1/2X8 1/2	1
26	AF01 0017	Cassette Body	1
27	AA00 2079	Decal Sheet - Small - A4	1
27	AA00 2084	Decal Sheet - Small - LT	1
28	AF01 7004	Rear Fence	1
29	AA16 2051	Cushion	2
101	0344 0060F	Philips Truss Head Screw - M4x6	
102	0443 0060W	Hexagon Head Tapping Screw - M3x6	
103	0965 4008W	Tapping Screw with Flat Washer - M4x8	
104	0805 0073	Retaining Ring - M5	
105	0965 4010W	Tapping Screw with Flat Washer - M4x10	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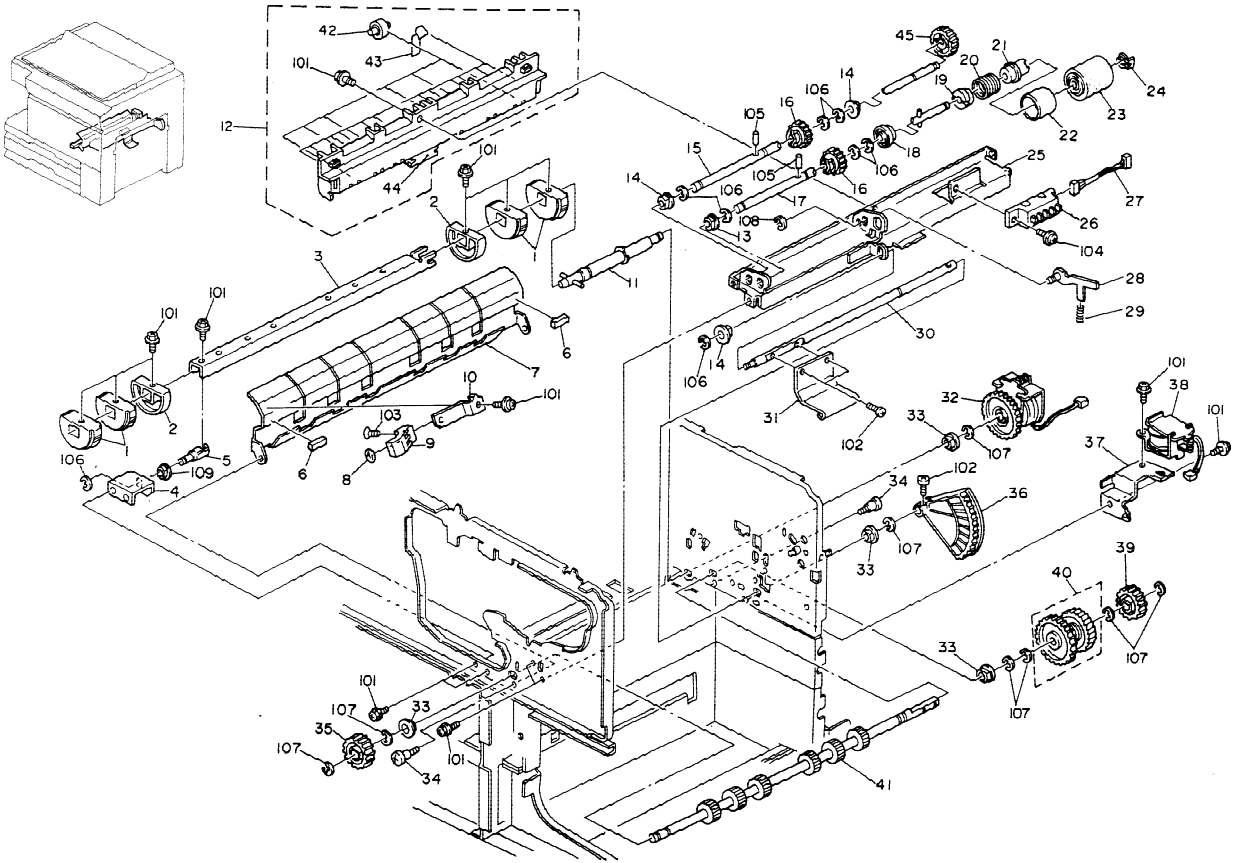
9. PAPER FEED AND REGISTRATION (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 7684	Development Rail	1
2	A048 5226	Pre-Transfer Lamp	1
3	A048 7689	Stay - Development Rail	1
4	AA15 0203	Mylar Seal - 80x20	1
5	A048 3913	Upper Transfer Guide	1
6	AA06 0254	Spring - Upper Transfer Guide	1
7	A048 3898	Lower Transfer Guide	1
8	AF02 0151	Lower Registration Roller	1
9	AF02 1039	Upper Registration Roller	1
10	AA08 0082	Bushing - Front Registration Roller	1
11	AA14 3287	Shoulder Screw - M3	3
12	5442 2754	Spring - Registration Roller	2
13	5053 0223	Bushing - 8mm	8
14	AG05 1071	Knob - Registration Guide Plate	1
15	AG05 0047	Drive Roller Knob	1
16	AB01 3445	Gear - 30Z	1
17	AA14 3268	Middle Drive Roller Shaft	1
18	A048 2628	Separation Support Plate	2
19	A048 2295	Drum Guide Roller	1
20	A048 2625	Separation Guide Plate	1
21	AF03 0002	Pick-up Roller	1
22	AB01 3079	Gear - 21T	1
23	A048 2589	Pick-up Bracket	1
24	AA06 0262	Spring	1
25	AA14 0286	1st Feed Shaft	1
26	A048 2576	Middle Registration Guide	1
27	AA02 0001	Drawer Tray Magnet	2
28	AB04 0005	Paper Feed Clutch	1
29	AA08 0083	Bushing - Rear Registration Roller	1
30	AF03 1006	Feed Roller	1
31	5447 2768	Stepped Screw - M3	2
32	AX20 0041	Magnetic Clutch	1
33	A048 2065	PTL Support Plate	1
34	A048 2571	Lower Registration Guide	1
35	A048 2562	Upper Registration Guide	1
36	AA06 0261	Spring	1
37	AW02 0024	Photointerruptor	1
38	A048 2569	Photo Interruptor Bracket	1
39	5447 2681	Snap Ring	2
40	5215 2621	Snap Ring - M6	1
41	A009 2751	Knob - Registration Roller	1
42	5205 2865	Bushing - Paper Feed Roller	7
43	5304 1639	Bushing - 8mm	3
44	A054 2696	Rear Cassette Holder - 3rd Feed	1
45	A054 2697	Front Cassette Holder - 3rd Feed	1
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0313 0040W	Philips Pan Head Screw - M3x4	
103	0951 4006W	Philips Screw With Flat Washer - M4x6	
104	0313 0300W	Philips Pan Head Screw - M3x30	
105	0720 0040W	Retaining Ring - M4	
106	0720 0060W	Retaining Ring - M6	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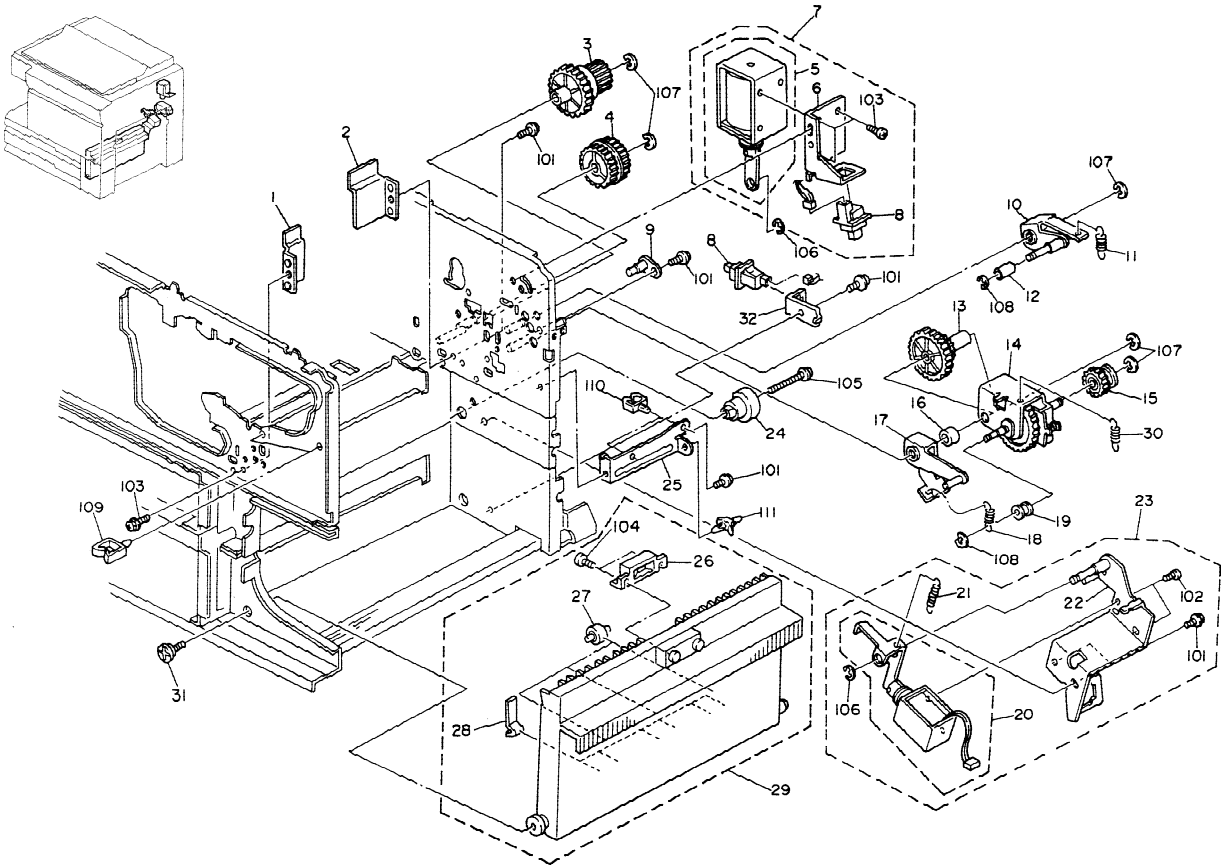
10. PAPER FEED AND REGISTRATION II (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 9004	Semicirculer Feed Roller - 4pcs/set	1
2	A048 2885	Paper Retainer	2
3	A048 2882	Paper Feed Shaft	1
4	A048 2883	Paper Feed Bracket	1
5	A048 2884	Paper Feed Rivet	1
6	AA02 0003	Slide Lever Magnet	2
7	A048 2645	Transport Guide Plate	1
8	A048 1356	Decal - A1	1
9	AG05 1070	Middle Guide Plate Knob	1
10	A048 2648	Knob Bracket	1
11	A048 2710	Drive Shaft - Paper Feed	1
12	A054 2601	Middle Guide Plate	1
13	5053 0709	Bushing - 6x10x6mm	1
14	5053 0447	Bushing - 6mm	5
15	AA14 0290	Separation Drive Shaft	1
16	AB01 3420	Gear - 18Z	2
17	AA14 0287	Separation Pressure Shaft	1
18	AA08 0063	Bushing - 12x16x7	1
19	5447 2695	Input Hub	1
20	AA06 6105	Release Spring	1
21	5447 2676	Output Hub	1
22	5447 2678	Slip Clutch Cover	1
23	5206 2605	Separation Roller	1
24	5447 2681	Snap Ring	2
25	A048 2596	Paper Feed Stay	1
26	AW50 0010	Push Switch	1
27	A048 5314	Harness - Paper Size Sensor	1
28	A048 2612	Separation Pressure Lever	1
29	AA06 3148	Pressure Spring	1
30	AA14 0288	Lift Arm Shaft	1
31	A048 2643	Cassette Bottom Lever	1
32	A048 5262	Paper Feed Clutch	1
33	5053 0223	Bushing - 8mm	8
34	5203 2679	Pinion Tightening Screw - M4x5	2
35	AB01 3421	Gear - 18Z	1
36	AB01 3173	Gear - 38Z	1
37	A048 2722	Paper Feed Solenoid Bracket	1
38	AX07 0007	Paper Feed Solenoid	1
39	AB01 3446	Gear - 18Z	1
40	AB04 0006	Middle Drive Clutch	1
41	AF02 0180	Middle Drive Roller - 2nd Feed	1
42	AF02 2042	Middle Pressure Roller	6
43	A054 2983	Spring Plate	12
44	A054 2984	Magnet Catch	1
45	AB01 3422	Gear - 27Z	1
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0314 0080W	Philips Pan Head Screw - M4x8	
103	0323 0050W	Philips Sunken Head Screw - M3x5	
104	0951 3006W	Philips Screw With Flat Washer - M3x6	
105	0632 0100G	Pin - 2x10mm	
106	0720 0040E	Retaining Ring - M4	
107	0720 0060E	Retaining Ring - M6	
108	0720 0030E	Retaining Ring - M3	
109	0805 3385	Bushing - 6mm	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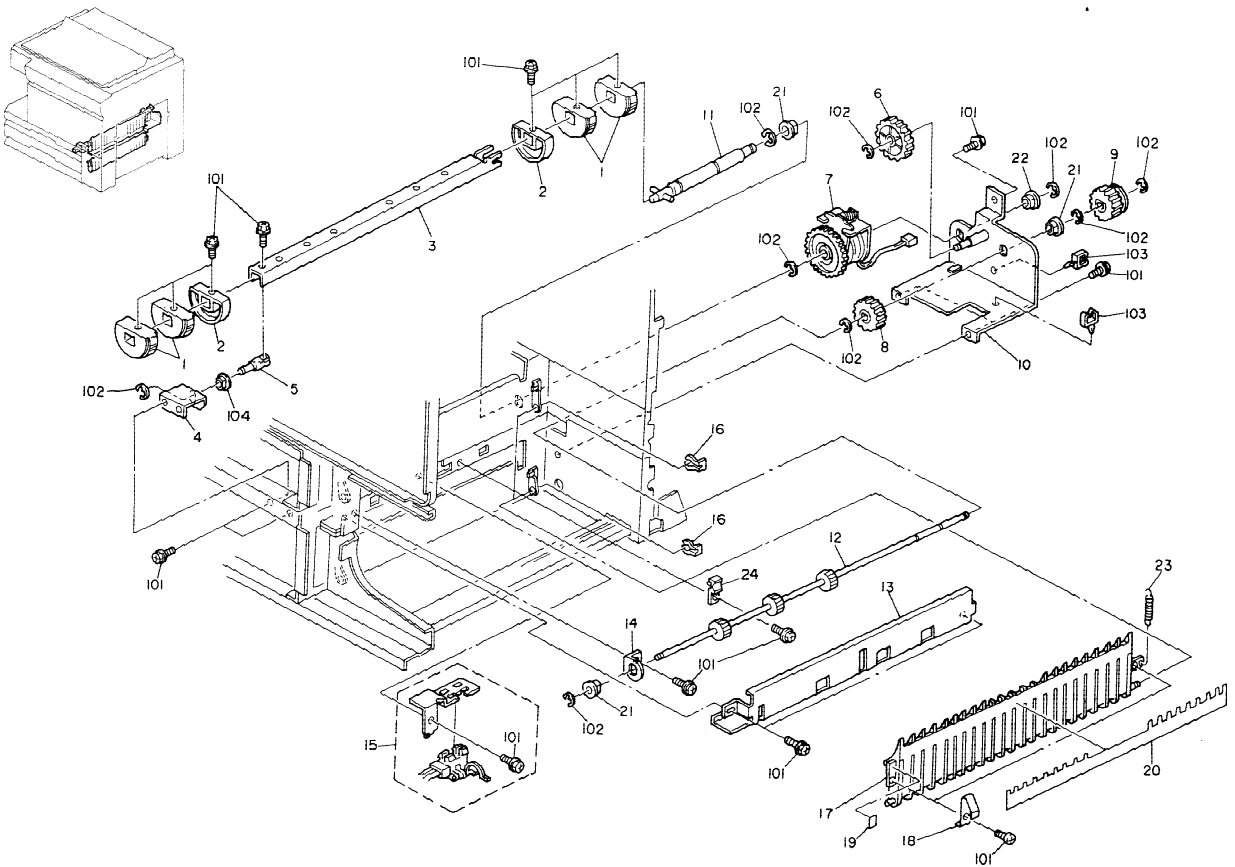
11. PAPER FEED AND REGISTRATION III (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 2664	Front Guide Plate Holder	1
2	A048 2665	Rear Guide Plate Holder	1
3	AB01 7156	Pulley - 44Z	1
4	AB01 7157	Gear - 32Z and 35Z	1
5	A048 2719	Pick-up Solenoid Lever	1
6	A048 2718	Pick-up Solenoid Bracket	1
7	A048 2715	Pick-up Solenoid Ass'y	1
8	AW50 0012	Push Switch	6
9	A048 2951	Front Guide Holder	2
10	A048 2734	Cassette Release Arm	1
11	AA06 0268	Release Arm Spring	1
12	AA13 2115	Collar - Cam Follower	1
13	AB01 7158	Gear - 14Z	1
14	A048 5260	Paper Lift Clutch	1
15	AB01 7159	Gear - 16Z	1
16	AA13 2116	Collar - 8	1
17	A048 2731	Release Arm	1
18	AA06 0342	Lever Spring	1
19	AA13 2117	Collar - Clutch	1
20	A048 2755	Drive Solenoid	1
21	5447 2743	Lever Spring	1
22	A048 2751	Drive Solenoid Bracket	1
23	A048 2750	Drive Solenoid Ass'y	1
24	A048 2675	Cam - Lower Right Cover	1
25	A054 5858	Main Board Bracket	1
26	AG07 0004	Magnet Catch Ass'y	2
27	AF02 2042	Middle Pressure Roller	6
28	A048 2679	Spring Plate	12
29	A054 2670	Lower Right Cover	1
30	AA06 0263	Spring - Clutch	1
31	5442 2117	Shoulder Screw - Hinge	1
32	A054 1182	Bracket - Sensor Cover	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0313 0040W	Philips Pan Head Screw - M3x4	
103	0313 0060W	Philips Pan Head Screw - M3x6	
104	0802 5085	Tapping Screw - M4x8	
105	0951 3020W	Philips Screw with Flat Washer - M3x20	
106	0720 0040E	Retaining Ring - M4	
107	0720 0060E	Retaining Ring - M6	
108	0720 0030E	Retaining Ring - M3	
109	1105 0199	Clamp	
110	1105 0230	Clamp	
111	1105 0159	PCB Stud	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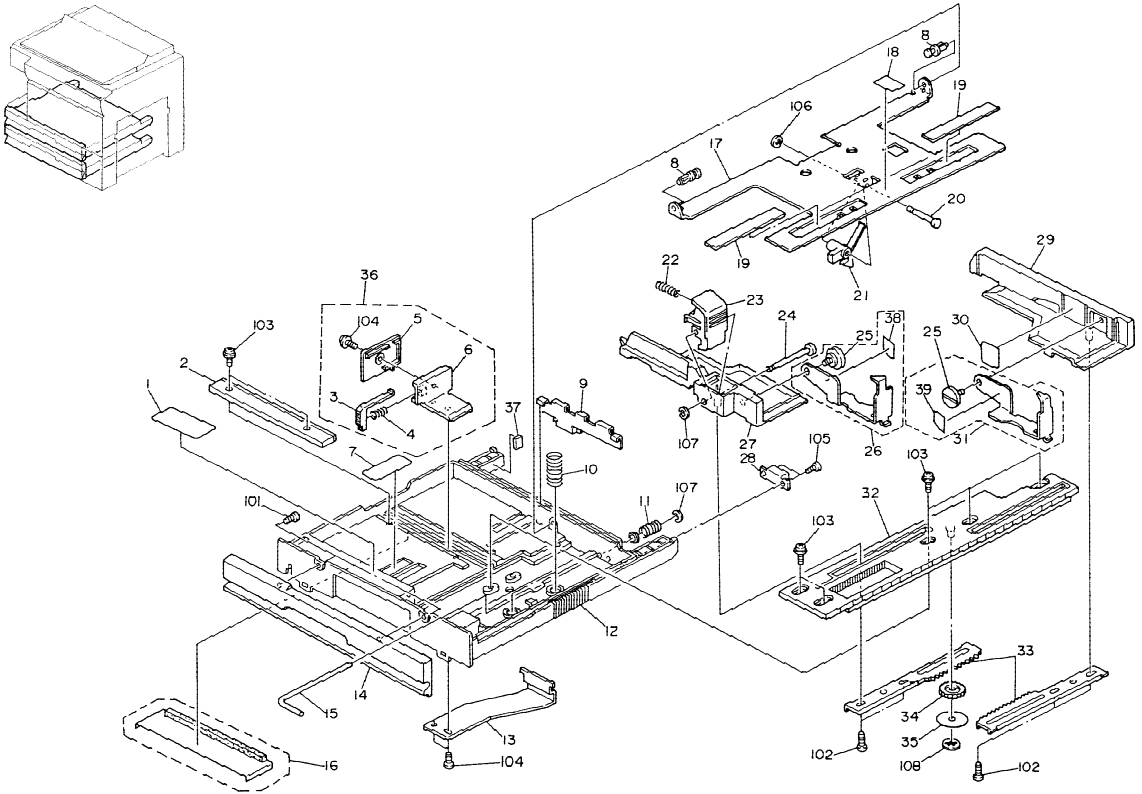
12. PAPER FEED AND REGISTRATION IV (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 9004	Semicirculer Feed Roller - 4pcs/set	1
2	A048 2885	Paper Retainer	2
3	A048 2882	Paper Feed Shaft	1
4	A048 2883	Paper Feed Bracket	1
5	A048 2884	Paper Feed Rivet	1
6	AB01 3423	Gear - 26T	1
7	A054 5262	Paper Feed Clutch - 3rd Feed	1
8	AB01 3106	Gear - Drive - Third - Z18	1
9	AB03 0262	Pulley	1
10	A054 2968	3rd Feed Bracket	1
11	A048 2710	Drive Shaft - Paper Feed	1
12	AF02 0179	Middle Drive Roller - 3rd Feed	1
13	A054 2975	Middle Drive Roller Guide	1
14	A054 2988	Middle Drive Roller Bracket	1
15	A054 2964	Middle Sensor Bracket	1
16	5206 2686	Snap Ring	1
17	A054 2973	Vertical Transport Guide	2
18	A054 2974	Spring Plate - Vertical Transport	2
19	A054 2977	Decal - Vertical Transport Guide	2
20	A054 2982	Mylar Seal - Vertical Transport	2
21	5053 0447	Bushing - 6mm	5
22	5053 0223	Bushing - 8mm	8
23	AA06 0324	Vertical Transport Guide Spring	1
24	A054 2989	Middle Drive Roller Stopper	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0720 0040E	Retaining Ring - M4	
103	1105 0199	Clamp	
104	0805 3385	Bushing - 6mm	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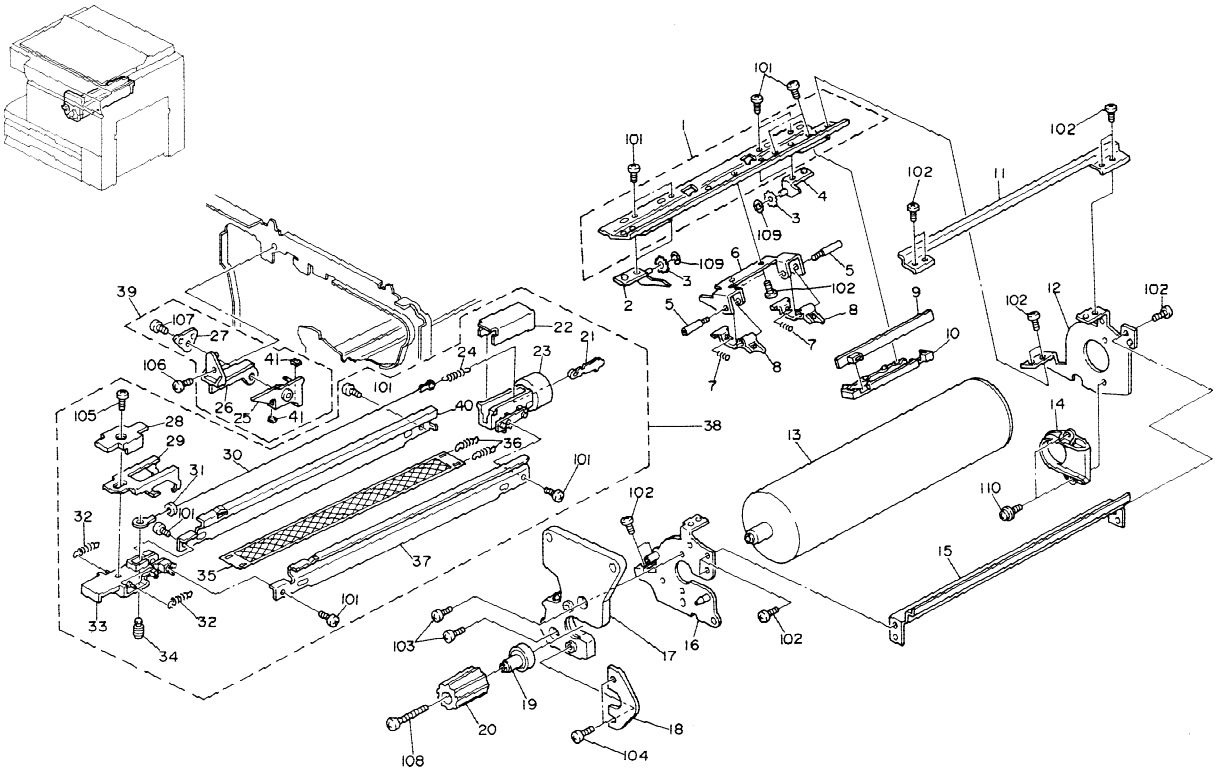
13. PAPER TRAY (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A048 2771	Paper Tray Ass'y - LT	1
1	A048 2897	Decal - Paper Tray	1
2	A048 2856	Scale End Fence - LT	1
2	A048 2857	End Fence Scale - A4	1
2	A048 2855	End Fence Scale - A4/B4	1
3	A048 2828	End Fence Stopper	1
4	AA06 3156	Spring - End Fence Stopper	1
5	A048 2824	End Fence Cover	1
6	A048 2876	End Fence	1
7	A048 2896	Decal - Left Scale - LT	1
7	A048 2895	Decal - Left Scale - A4	1
7	A048 2894	Decal - Left Scale - A4/B4	1
8	A048 2838	Nylon Rivet	2
9	A048 2832	Size Actuator - LT	1
9	A048 2831	Paper Size Actuator - A4	1
10	AA06 3146	Spring - Paper Feed Pressure	2
11	AA06 3147	Spring - Bottom Plate	1
12	AF01 0022	Paper Tray	1
13	A048 2839	Paper Size Actuator Arm	1
14	A048 2811	Front Cover - Paper Tray	1
15	A048 2840	Release Shaft	1
16	A048 2854	Bottom Seal - Paper Tray	1
17	AF01 1009	Bottom Plate	1
18	AA00 1173	Decal - Bottom Plate	1
19	AF01 3001	Bottom Plate Pad	2
20	AA14 8230	Pin - Bottom Plate	1
21	A048 2842	Lock Arm	1
22	AA06 3081	Spring - Side Fence Stopper	1
23	A048 2817	Side Fence Stopper	1
24	AA14 8302	Shaft	1
25	AA14 3288	Stepped Screw	1
26	A048 2791	Front Corner Separator	1
27	AF01 6036	Front Side Fence	1
28	AG07 0004	Magnet Catch Ass'y	2
29	AF01 6038	Rear Side Fence	1
30	AA00 1172	Decal - Paper Level	1
31	A048 2792	Rear Corner Separator	1
32	A048 2819	Registration Adjustment Plate	1
33	A048 2835	Side Fence Gear	2
34	5215 2687	Gear - 16T	2
35	A006 2699	Spacer - 5.1x20mm	2
36	A048 2803	End Fence Ass'y	1
37	AA16 2035	Cushion - Paper Tray	1
38	A048 2877	Front Corner Separator Seal	1
39	A048 2878	Rear Corner Separator Seal	1
101	0344 0080D	Philips Truss Head Screw - M4x8	
102	0965 3008W	Tapping Screw With Flat Washer - M3x8	
103	0965 3008F	Tapping Screw with Flat Washer - M3x8	
104	0413 0082W	Tapping Screw - M3x8	
105	0802 5085	Tapping Screw - M4x8	
106	0720 0025E	Retaining Ring - M2.5	
107	0720 0030E	Retaining Ring - M3	
108	0805 0073	Retaining Ring - M5	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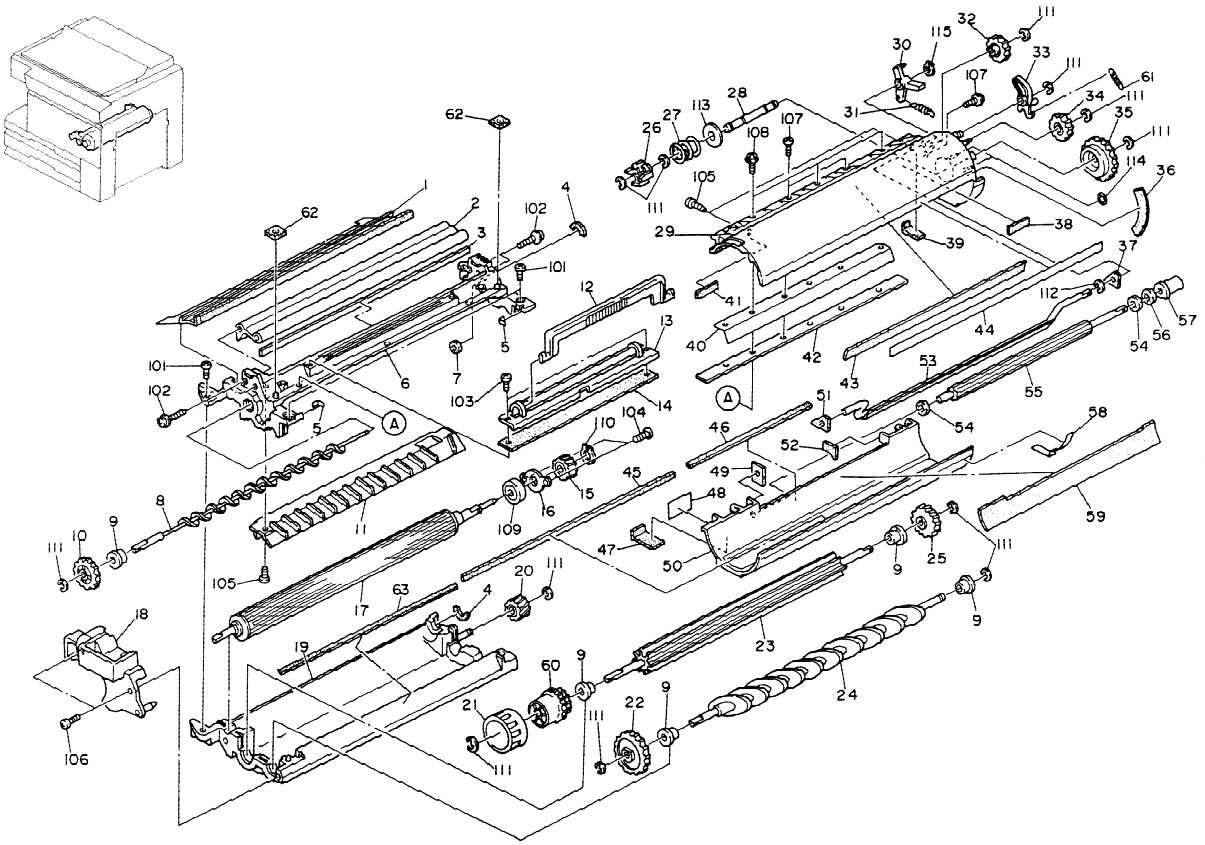
14. DRUM SECTION (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 2270	Left Drum Stay	1
2	A048 2275	Front Transport Bracket	2
3	A048 2276	Ring - Transport Bracket	4
4	A048 2278	Rear Transport Bracket	2
5	A006 2274	Pick-off Pawl Shaft	2
6	A048 2273	Pick-off Pawl Bracket	1
7	AA06 3106	Spring - Pick-up Pawl	2
8	A006 2270	Pick-off Pawl	2
9	A006 5222	ID Sensor Board	1
10	A006 2278	Sensor Holder	1
11	A048 2268	Upper Left Drum Stay	1
12	A048 2281	Rear Drum Side Plate	1
13	A006 9510	Drum	1
14	A006 2280	Drum Guide	1
15	A048 2269	Right Drum Stay	1
16	A048 2263	Front Drum Side Plate	1
17	A048 2260	Drum Support Plate	1
18	A006 2260	Drum Holder	1
19	AA13 2074	Knob Collar	1
20	AG05 0031	Drum Shaft Knob	1
21	5442 2110	Plug - Corona Unit	1
22	A006 2118	Rear Cover - Charge Corona	1
23	AD02 2178	Rear End Block - Main Corona	1
24	5442 2108	Spring - Corona Wire	3
25	A006 2121	Cleaner Holder	1
26	A006 2122	Cleaner Stay	1
27	A006 2123	Cleaner Stopper	1
28	A006 2117	Front Cover - Charge Corona	1
29	A006 2114	Grid Anchor	1
30	A048 9001	Charge Corona Wire - 10pcs/set	1
31	A030 6231	Corona Wire Ring	1
32	AA06 0141	Spring - Charge Corona Grid	2
33	AD02 2187	Front End Block - Charge Corona	1
34	5442 2069	Plastic Screw - Main Corona	1
35	A006 2111	Charge Corona Grid	1
36	AA06 0255	Spring - Rear Charge Corona Grid	2
37	AD02 3060	Right Main Corona Unit Casing	1
38	A048 2008	Charge Corona Unit	1
39	A006 2055	Charge Corona Cleaner	1
40	AD02 3059	Left Main Corona Unit Casing	1
41	A008 2087	Corona Cleaner Pad	2
101	0413 0062W	Tapping Screw - M3x6	
102	0313 0040W	Philips Pan Head Screw - M3x4	
103	0314 0100W	Philips Pan Head Screw - M4x10	
104	0314 0200W	Philips Pan Head Screw - M4x20	
105	0413 0082W	Tapping Screw - M3x8	
106	0951 4006W	Philips Screw With Flat Washer - M4x6	
107	0971 3006W	Philips Polycarbonate Screw - M3x6	
108	0315 0250W	Philips Pan Head Screw - M5x25	
109	0805 0077	Retaing Ring - M3	
110	0951 3005W	Philips Screw with Flat Washer - M3x5	



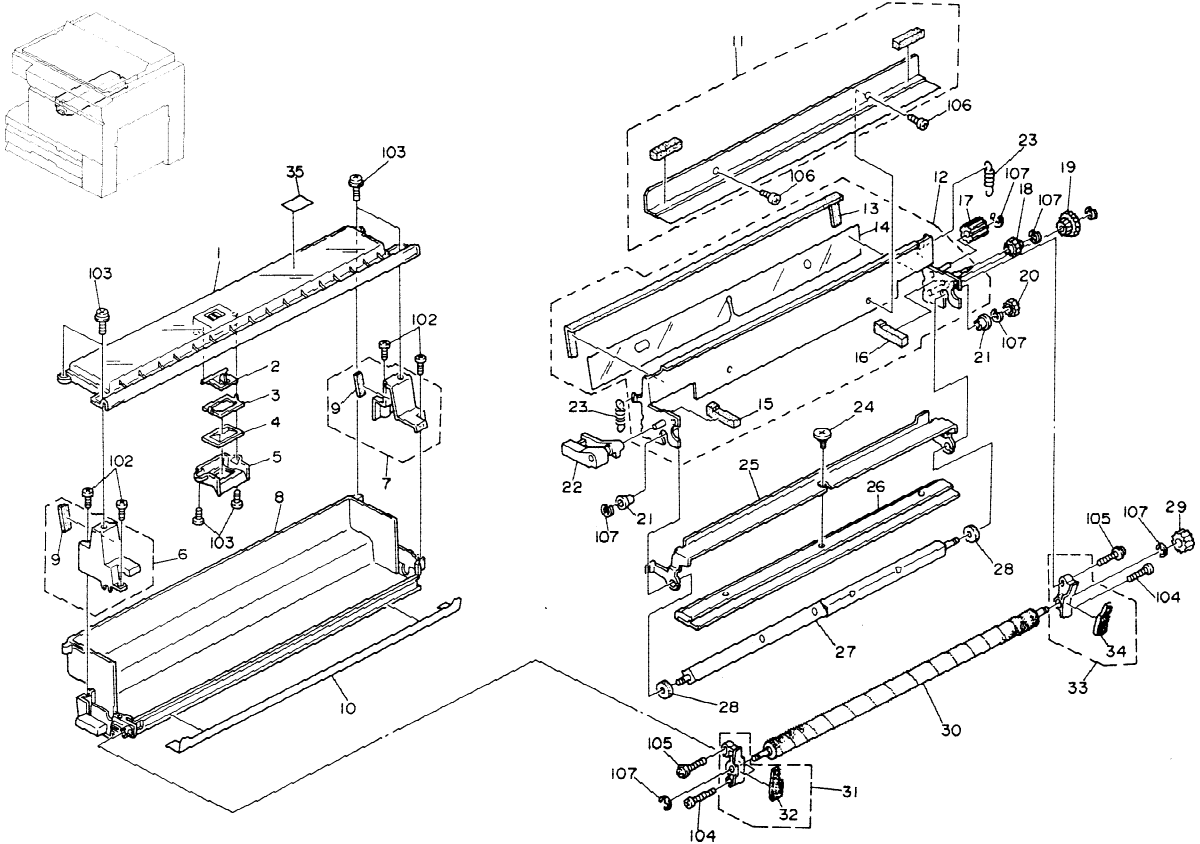
15. DEVELOPMENT UNIT (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A048 7550	Development Unit	1
*	A048 7570	Toner Supply Unit - 115V	1
*	A048 7571	Toner Supply Unit - 220/240V	1
*	A313 3050	Toner Supply Unit - Color	1
1	A048 7628	Entrance Seal Plate	1
2	AD03 0016	Doctor Plate	1
3	AA15 1491	Seal - 3x8x100	1
4	AA15 2136	Seal - Development Roller	2
5	AA15 1186	Front Side Plate Seal	2
6	A048 7600	Upper Casing	1
7	AA15 2019	Seal - Mixing Auger	1
8	AD03 7023	Mixing Auger	1
9	5205 3103	Bushing - 6mm	5
10	AB01 3441	Gear - 20Z	1
11	AD03 6021	Mixing Vanes	1
12	A048 7623	Grip - Development Unit	1
13	A048 7624	Filter Bracket	1
14	AA15 1490	Filter	1
15	AB01 3437	Gear - 19Z	1
16	A048 7631	Bearing Retainer	1
17	AD03 1025	Development Roller	1
18	A048 7632	Gear Cover	1
19	A048 7601	Lower Casing	1
20	AB01 3438	Gear - 15Z	1
21	5215 3089	Developer Knob	1
22	AB01 3440	Gear - 34Z	1
23	AD03 8022	Raddle Roller	1
24	AD03 8023	Developer Agitator	1
25	AB01 3439	Gear - 23Z	1
26	5215 3328	Joint - Hopper	1
27	5215 3347	Spring - Gear	1
28	5215 3327	Shaft - Agitator	1
29	A048 7577	Upper Casing - Toner Supply Unit - 115V	1
29	A048 7578	Upper Casing - Tonner Supply Unit - 200V	1
30	A048 7679	Toner End Actuator Arm	1
31	AA06 0265	Spring - Toner End	1
32	AB01 3442	Gear - 18Z	1
33	A048 7677	Toner End Actuator Lever	1
34	AB01 3443	Gear - 20Z	1
35	AB01 3444	Gear - 41Z	1
36	5215 3295	Hopper Filter	1
37	AA15 1485	Seal - Rear Hopper	1
38	AA15 1481	Seal - 2x12x23	1
39	AA15 1606	Seal - 23x90	1
40	A048 7670	Slitter	1
41	AA15 1480	Seal - 2x12x34	1
42	A048 7671	Plate Nut	1
43	AA15 1482	Seal - 4x21x319	1
44	AA15 0197	Seal - 12x360	1
45	AA15 1489	Seal - 2x5x37.5	1
46	AA15 1476	Seal - 3x6x258	1
47	AA15 1479	Seal - 2x22x37	1
48	AA15 0196	Seal - 25x30	1
49	AA15 1486	Seal - Front Hopper	1
50	A048 7654	Lower Casing - Toner Supply Unit	1
51	AA15 1484	Seal - Front Hopper	1
52	AA15 1487	Seal - Rear Hopper	1
53	A048 7676	Toner End Lever	1
54	5215 3303	Seal - Toner Supply Roller	2
55	AD03 3014	Toner Supply Roller	1
56	AA15 1488	Seal - Hopper	1
57	A048 7669	Boss - Toner Supply Roller	1
58	AA15 0198	Seal - 19x80	1
59	AA15 1483	Seal - 2x34.5x330	1
60	A048 7612	Development Roller Knob	1
61	AA06 0267	Spring - Toner End Actuator Lever	1
62	AA15 1604	Seal - 16x9x3	2
63	AA15 1605	Seal - 323x4x3	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0313 0060W	Philips Pan Head Screw - M3x6	
102	0951 3020W	Philips Screw with Flat Washer - M3x20	
103	0951 3008W	Philips Screw with Flat Washer - M3x8	
104	0313 0040W	Philips Pan Head Screw - M3x4	
105	0413 0082W	Tapping Screw - M3x8	
106	0313 0080W	Philips Pan Head Screw - M3x8	
107	0951 3006W	Philips Screw With Flat Washer - M3x6	
108	0951 3008B	Philips Screw With Flat Washer - M3x8	
109	0805 3415	Ball Bearing - M9	
110	0727 0090E	Retaining Ring C - M9	
111	0720 0040E	Retaining Ring - M4	
112	0720 0030E	Retaining Ring - M3	
113	0807 4103	Spacer - 0.5mm	
114	0805 0077	Retaing Ring - M3	
115	0728 0040E	Retaining Ring C - M4	

Index No.	Part No.	Description	Q'ty per Assembly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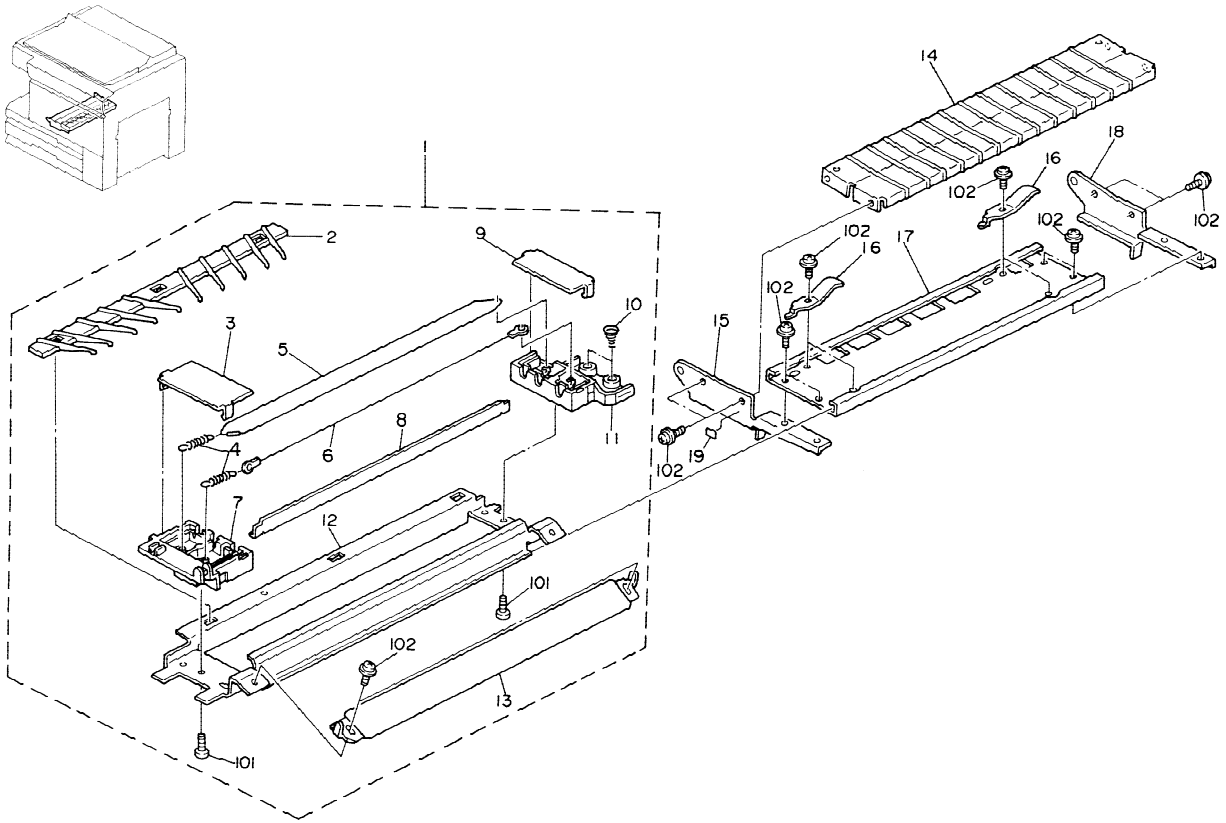
16. CLEANING UNIT (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A048 3555	Cleaning Unit	1
1	A048 3581	Upper Cleaning Case	1
2	A005 3585	Sensor Feeler - Toner Over Flow	1
3	A005 3587	Feeler Supporter	1
4	A005 3586	Rubber Seal - Toner Collection	1
5	A006 3584	Toner Collection Hosing	1
6	A048 3583	Front Cleaning Cover	1
7	A048 3584	Rear Cleaning Cover	1
8	A048 3588	Lower Cleaning Casing	1
9	AA15 0193	Seal - 4x25x1.6	2
10	A006 9003	Cleaning Seal	1
11	A048 3570	Cleaning Blade Cleaner	1
12	A048 3553	Cleaning Unit Frame	1
13	AA15 0189	Seal - Cleaning Unit	1
14	AA15 2015	Toner Collection Seal	1
15	AA15 0190	Seal - Front Cleaning Blade	1
16	AA15 0191	Seal - Rear Cleaning Blade	1
17	AB01 1082	Gear - 17Z	1
18	AB01 1083	Gear - 18Z	1
19	AB01 7160	Gear - 17Z And 35Z	1
20	AB01 1084	Gear - 17Z	1
21	AA08 0030	Bushing - 5x13x7	2
22	A048 3593	Release Lever	1
23	AA06 0099	Cleaning Blade Spring	2
24	5446 3648	Stepped Screw - M4	1
25	A048 3556	Blade Bracket	1
26	A048 3565	Cleaning Blade	1
27	A006 3660	Toner Collection Shaft	1
28	AA15 1109	Seal - 5x16x5	2
29	AB01 1070	Gear - 12Z	1
30	AD04 2011	Cleaning Brush	1
31	A006 3603	Front Brush Holder	1
32	AA15 2016	Side Seal - Cleaning Front	1
33	A006 3604	Rear Brush Holder	1
34	AA15 2017	Side Seal - Cleaning Rear	1
35	AA00 0059	Caution Decal - English	1
35	AA00 0060	Caution Decal - 4 Languages	1
101	0951 3008W	Philips Screw with Flat Washer - M3x8	
102	0413 0082W	Tapping Screw - M3x8	
103	0413 0062W	Tapping Screw - M3x6	
104	0413 0142W	Tapping Screw - M3x14	
105	0951 3010W	Philips Screw with Flat Washer - M3x10	
106	0313 0060W	Philips Pan Head Screw - M3x6	
107	0720 0040E	Retaining Ring - M4	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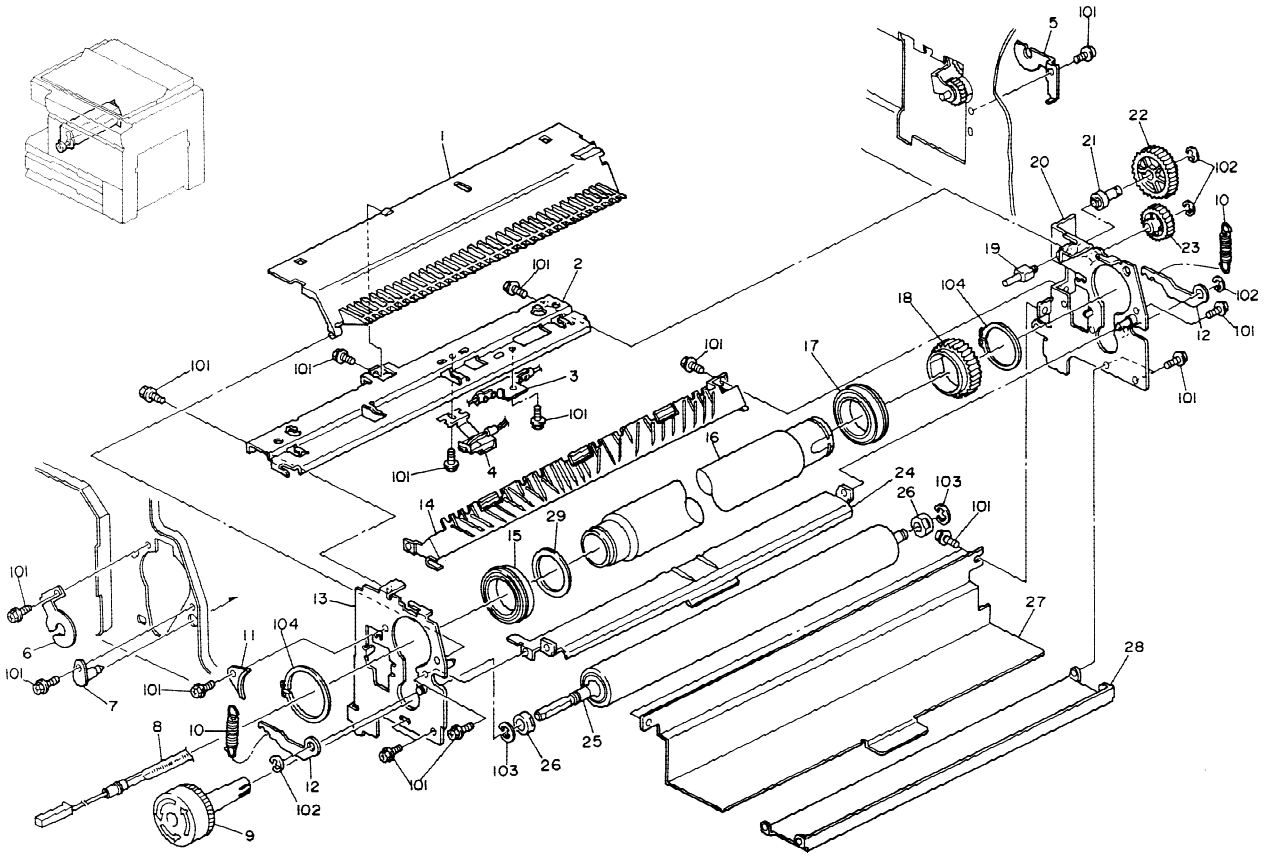
17. TRANSPORT SECTION (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 3876	T&S Corona Unit	1
2	A048 3877	T&S Corona Guide	1
3	A048 3883	Front End Block Cover	1
4	5442 2108	Spring - Corona Wire	3
5	A048 9003	Separation Corona Wire - 10pcs/set	1
6	A048 9002	Transfer Corona Wire - 10pcs/set	1
7	AD02 2179	Front End Block - T&S Corona	1
8	AD02 3058	T&S Corona Guide Plate	1
9	A048 3887	Rear End Block Cover	1
10	AA06 3036	Terminal Spring	2
11	AD02 2180	Rear End Block - T&S Corona	1
12	AD02 3057	T&S Corona Unit Casing	1
13	A048 3888	T&S Corona Guide Plate	1
14	A048 3854	Transport Guide Plate	1
15	A048 3852	Front Transport Frame	1
16	A048 3857	Spring Plate	4
17	A048 3856	T&S Rail	1
18	A048 3853	Rear Transport Frame	1
19	5203 1349	Rear Positioning Decal-development	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0413 0082W	Tapping Screw - M3x8	
102	0951 3005W	Philips Screw with Flat Washer - M3x5	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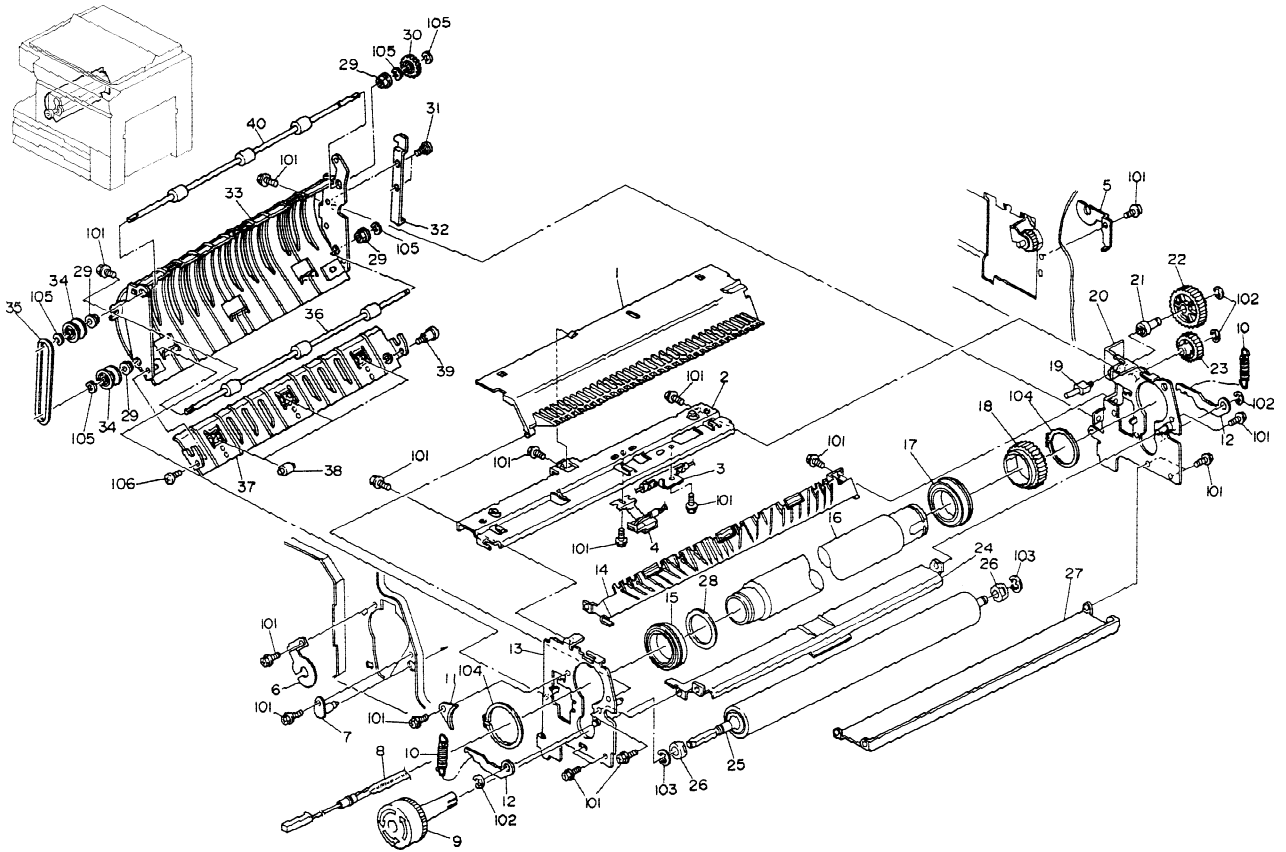
18. FUSING SECTION - 115V (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 4151	Fusing Cover	1
2	A048 4086	Upper Fusing Stay	1
3	A048 5435	Thermofuse	1
4	A048 5228	Thermistor	1
5	A048 4101	Rear Heater Holder	1
6	A048 4100	Front Heater Holder	1
7	A048 3860	Transport Bracket Holder	1
8	AX44 0031	Heater - 115V 700W	1
9	AG05 0046	Fusing Knob	1
10	AA06 0252	Pressure Spring	2
11	A048 4083	Stopper	1
12	A017 4085	Pressure Lever	2
13	A048 4071	Front Side Plate	1
14	A048 4161	Lower Guide Plate	1
15	AE03 0003	Ball Bearing - 30x42x7	1
16	AE01 1007	Hot Roller	1
17	AE03 0004	Ball Bearing - 30x47x9	1
18	AB01 3201	Gear - 40T	1
19	AA14 3267	Pin	1
20	A048 4076	Rear Side Plate	1
21	AA14 3266	Exit Drive Shaft	1
22	AB01 3417	Gear - 30Z	1
23	AB01 3418	Gear - 24Z	1
24	A048 4089	Lower Entrance Guide	1
25	AE02 0016	Pressure Roller	1
26	AE03 1002	Bushing - 8x14x7	2
27	A048 4201	Duplex Entrance Bracket	1
28	A048 4080	Lower Fusing Stay	1
29	A048 4084	Collar - 30mm	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0720 0040E	Retaining Ring - M4	
103	0720 0060E	Retaining Ring - M6	
104	0725 0300E	Retaining Ring C - M30	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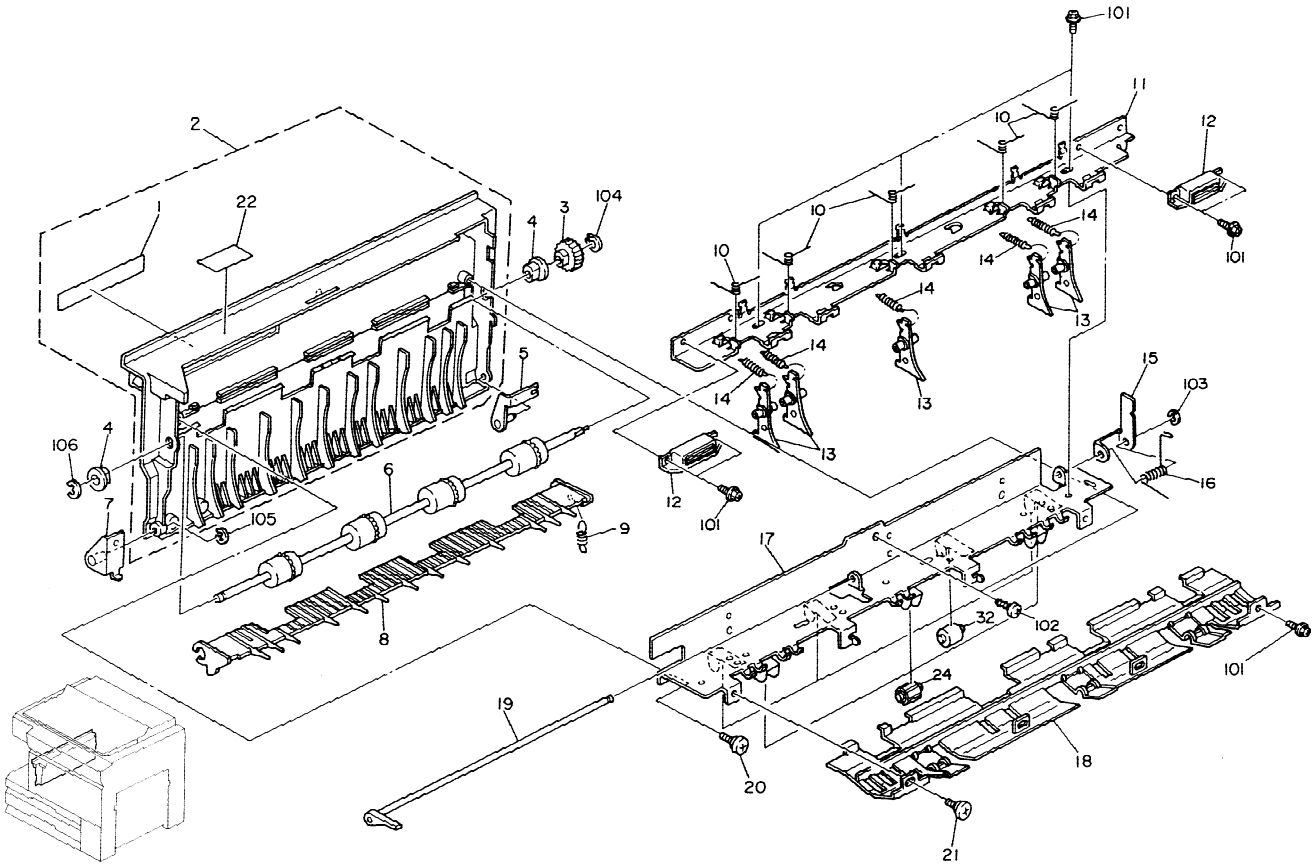
19. FUSING SECTION - 220/240V (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 4151	Fusing Cover	1
2	A048 4086	Upper Fusing Stay	1
3	A048 5435	Thermofuse	1
4	A048 5228	Thermistor	1
5	A048 4101	Rear Heater Holder	1
6	A048 4100	Front Heater Holder	1
7	A048 3860	Transport Bracket Holder	1
8	AX44 0032	Heater - 220V 700W	1
9	AG05 0046	Fusing Knob	1
10	AA06 0252	Pressure Spring	2
11	A048 4083	Stopper	1
12	A017 4085	Pressure Lever	2
13	A048 4071	Front Side Plate	1
14	A054 4161	Lower Guide Plate	1
15	AE03 0003	Ball Bearing - 30x42x7	1
16	AE01 1007	Hot Roller	1
17	AE03 0004	Ball Bearing - 30x47x9	1
18	AB01 3201	Gear - 40T	1
19	AA14 3267	Pin	1
20	A048 4076	Rear Side Plate	1
21	AA14 3266	Exit Drive Shaft	1
22	AB01 3417	Gear - 30Z	1
23	AB01 3418	Gear - 24Z	1
24	A048 4089	Lower Entrance Guide	1
25	AE02 0016	Pressure Roller	1
26	AE03 1002	Bushing - 8x14x7	2
27	A048 4080	Lower Fusing Stay	1
28	A048 4084	Collar - 30mm	1
29	AA08 0022	Bushing - 4x7x5mm	8
30	AB01 3427	Gear - 14Z	1
31	5447 2768	Stepped Screw - M3	2
32	A491 4880	Fusing Gate Lever	1
33	A491 4860	Upper Turn Guide Plate	1
34	A491 4885	Turn Roller Pulley	2
35	AA04 2004	Turn Roller Drive Belt	1
36	AF02 0195	Upper Turn Roller	1
37	A491 4870	Lower Turn Guide Plate	1
38	AF02 2043	Small Driven Roller	6
39	AA14 3070	Shoulder Screw - M2x2	3
40	AF02 0155	Lower Turn Roller	1
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0720 0040E	Retaining Ring - M4	
103	0720 0060E	Retaining Ring - M6	
104	0725 0300E	Retaining Ring C - M30	
105	0720 0030E	Retaining Ring - M3	
106	0313 0050W	Philips Pan Head Screw - M3x5	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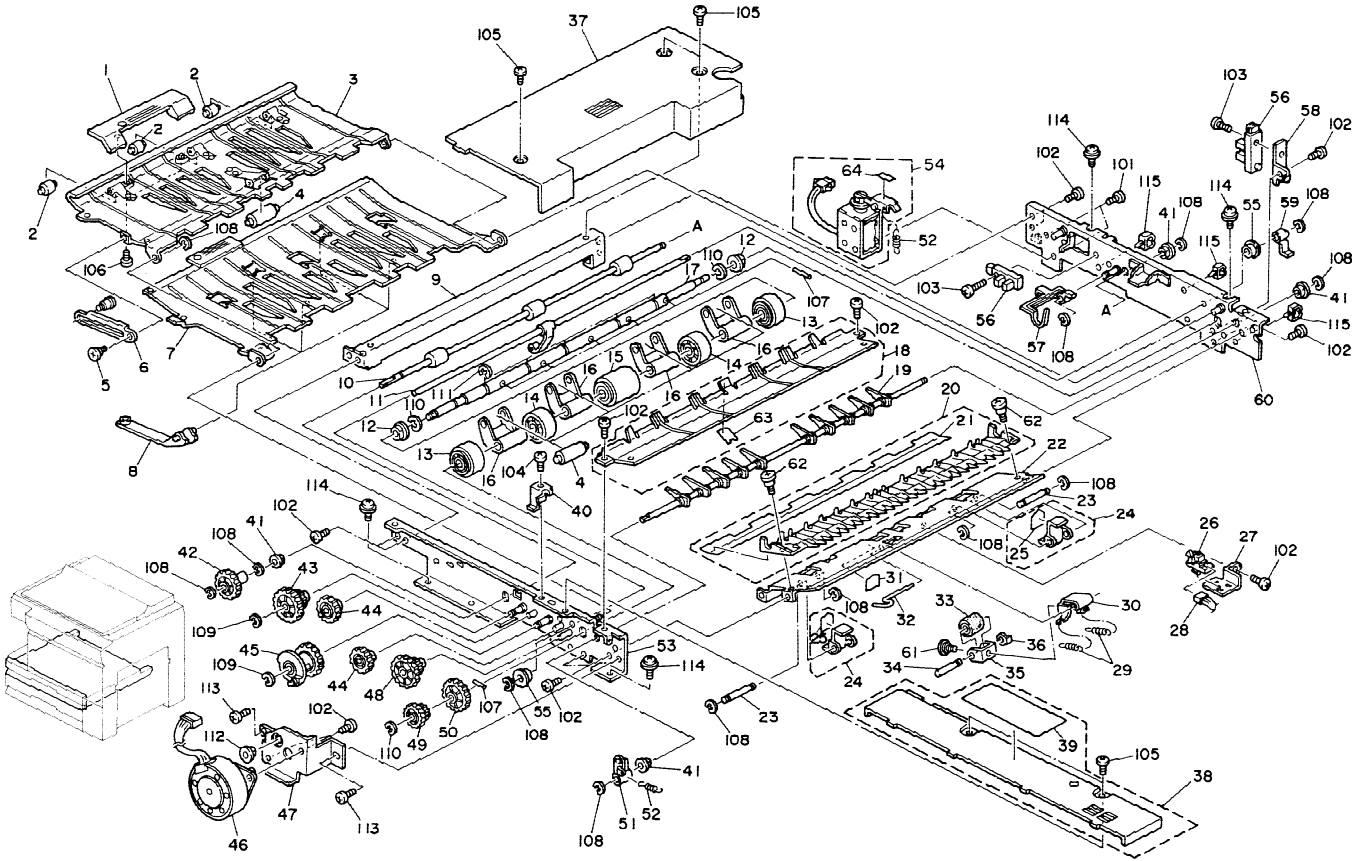
20. PAPER EXIT SECTION (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 1362	Decal - D2	1
2	A048 4260	Exit Cover	1
3	AB01 3419	Gear - 17Z	1
4	AA08 0081	Bushing - 6x10x9mm	2
5	A048 4277	Rear Holder - Paper Exit Unit	1
6	AF04 0037	Exit Drive Roller	1
7	A048 4300	Front Holder - Paper Exit Unit	1
8	A048 4351	Junction Gate	1
9	AA06 0272	Spring - Paper Stripper	1
10	AA06 6102	Spring - Hot Roller Stripper	5
11	A048 4288	Stripper Holder	1
12	AG07 0004	Magnet Catch Ass'y	2
13	A006 9002	Hot Roller Stripper (5pcs/Set)	1
14	AA06 0081	Stripper Spring	5
15	A048 4295	Actuator - Paper Exit Sensor	1
16	AA06 6103	Spring - Exit Sensor	1
17	A048 4281	Exit Frame	1
18	A048 4371	Upper Exit Guide	1
18	A054 4371	Upper Exit Guide (Duplex)	1
19	A048 4291	Feeler - Paper Exit Sensor	1
20	5447 2768	Stepped Screw - M3	2
21	5206 2684	Shoulder Screw - M3	3
22	AA00 0041	Decal - High Temperature	1
23	AF04 0031	Upper Exit Roller	4
24	AF02 2032	Turn Drive Roller	3

Index No.	Part No.	Description	Q'ty per Assembly
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0413 0082W	Tapping Screw - M3x8	
103	0720 0025E	Retaining Ring - M2.5	
104	0727 0040E	Retaining Ring - M4	
105	0720 0030E	Retaining Ring - M3	
106	0720 0050E	Retaining Ring - M5	



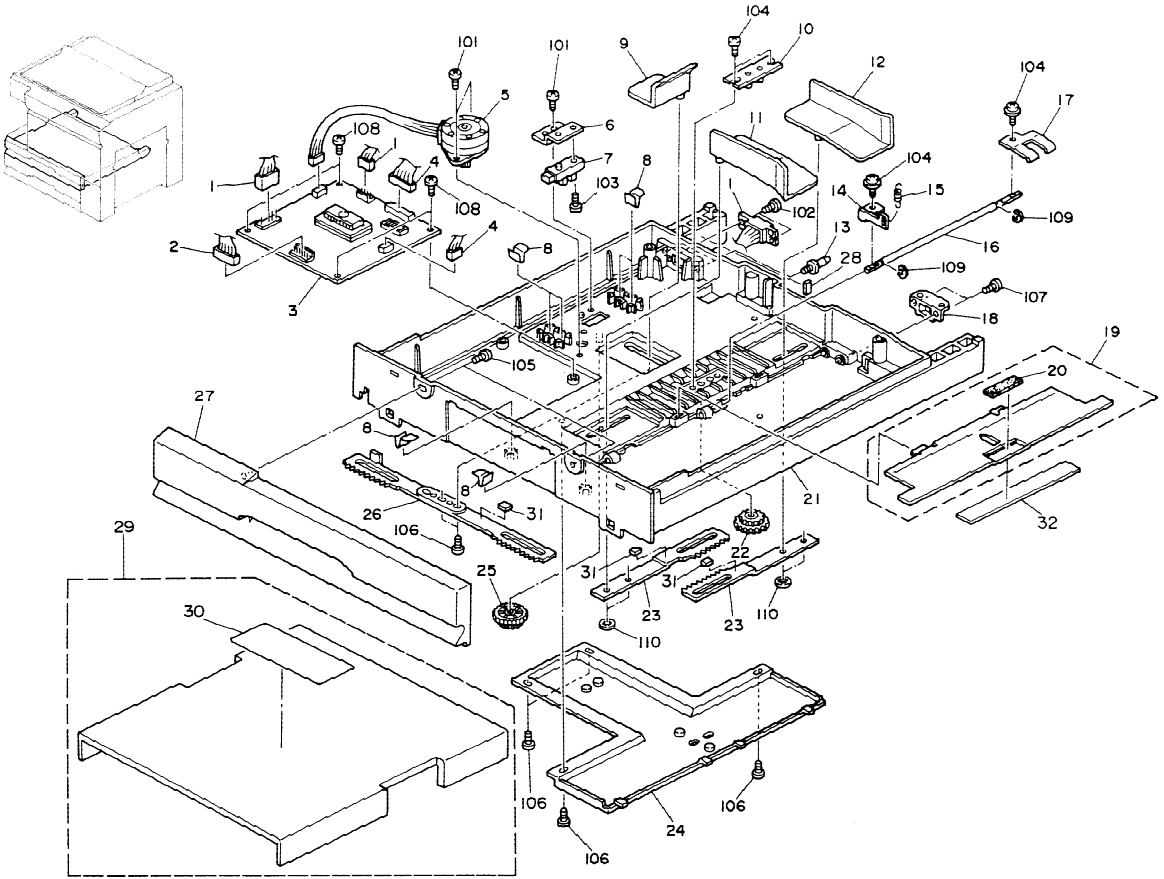
21. DUPLEX UNIT 1 - 220/240V (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	AG05 1067	Paper Removal Handle	1
2	AF02 2043	Small Driven Roller	3
3	A491 4730	Upper Guide Plate	1
4	AF02 2044	Large Driven Roller	5
5	5447 2768	Stepped Screw - M3	2
6	A491 4740	Guide Plate Link	1
7	A491 4750	Lower Guide Plate	1
8	A491 4765	Paper Holding Bar	4
9	A491 4720	Duplex Stay	1
10	AF02 0153	Paper Transport Roller	1
11	A491 4715	Paper End Actuator	1
12	5304 1639	Bushing - 8mm	3
13	AF02 0156	Stack Roller	2
14	AF02 2045	Stack Roller Holder	2
15	AF03 1008	Feed Roller	1
16	A491 4825	Holder - Large Driven Roller	4
17	AA14 0292	Feed Roller Shaft	1
18	A491 4759	Guide Plate	1
19	AF02 5013	Junction Gate	1
20	A491 4789	Inverter Guide Plate	1
21	A491 4790	Mylar Seal - Inverter Guide Plate	1
22	A491 4770	Guide Plate Paper Feed	1
23	AA14 5119	Jog Plate Shaft	2
24	A491 4786	Jog Plate	2
25	A491 4783	Mylar Seal - 0.1x18x23	2
26	AW02 0023	Paper Entrance Sensor	1
27	A491 4785	Bracket - Paper Entrance Sensor	1
28	A491 5302	Intermediate Harness	1
29	AA06 0245	Separation Roller Spring	2
30	A491 4815	Separation Roller Bracket	1
31	A491 4780	Mylar Seal - 0.1x22x24	1
32	A491 4817	Guide Pin - Separation Roller	1
33	AF03 2003	Separation Roller	1
34	AA14 5117	Separation Roller Shaft	1
35	A491 4810	Separation Roller Holder	1
36	5447 2681	Snap Ring	2
37	A491 4625	Upper Left Cover	1
38	A491 4903	Upper Front Cover	1
39	A491 4910	Decal - Removing Misfed Paper	1
40	A491 4705	Stopper - Bottom Plate Clutch	1
41	AA08 0022	Bushing - 4x7x5mm	8
42	AB01 3425	Gear - 28Z	1
43	AB01 7162	Gear - 14Z/36Z	1
44	AB01 3426	Gear - 22Z	2
45	AB04 0008	Bottom Plate Clutch	1
46	A491 5205	Transport Motor - DC30V	1
47	A491 4700	Transport Motor Bracket	1
48	AB01 7163	Gear - 14Z/28Z	1
49	AB01 7161	Gear - 14Z/45Z	1
50	AB01 3424	Gear - 28Z	1
51	A491 4725	Junction Gate Hook	1
52	5442 3233	Spring - Drive Wheel	2
53	A491 4670	Front Side Plate	1
54	A491 4832	Fusing Gate Solenoid	1
55	5443 2668	Bushing	2
56	AW02 0022	Photointerruptor	1
57	AA11 1010	Paper Entrance Feeler	1
58	A491 4710	Bracket - Paper End Sensor	1
59	AA11 1011	Paper End Feeler	1
60	A491 4680	Rear Side Plate	1
61	AA14 3076	Stepped Screw - M4	1
62	AA14 3287	Stepped Screw - M3	2
63	A491 4761	Guide Plate Mylar - 0.188x12x25	1
64	A491 4831	Mylar Seal - 0.188x9x33	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0313 0040B	Philips Pan Head Screw - M3x4	
102	0313 0050W	Philips Pan Head Screw - M3x5	
103	0314 0100W	Philips Pan Head Screw - M4x10	
104	0353 0050W	Tapping Screw - M3x5	
105	0353 0060F	Philips Truss Head Screw - M3x6	
106	0413 0062W	Tapping Screw - M3x6	
107	0632 0140E	Parallel Pin - M2x14	
108	0720 0030E	Retaining Ring - M3	
109	0720 0040E	Retaining Ring - M4	
110	0720 0060E	Retaining Ring - M6	
111	0720 0080E	Retaining Ring - M8	
112	0805 3366	Bushing - 6mm	
113	0951 3005W	Philips Screw With Flat Washer - M3x5	
114	0951 4006W	Philips Screw With Flat Washer - M4x6	
115	1105 0199	Clamp	

Index No.	Part No.	Description	Q'ty per Assembly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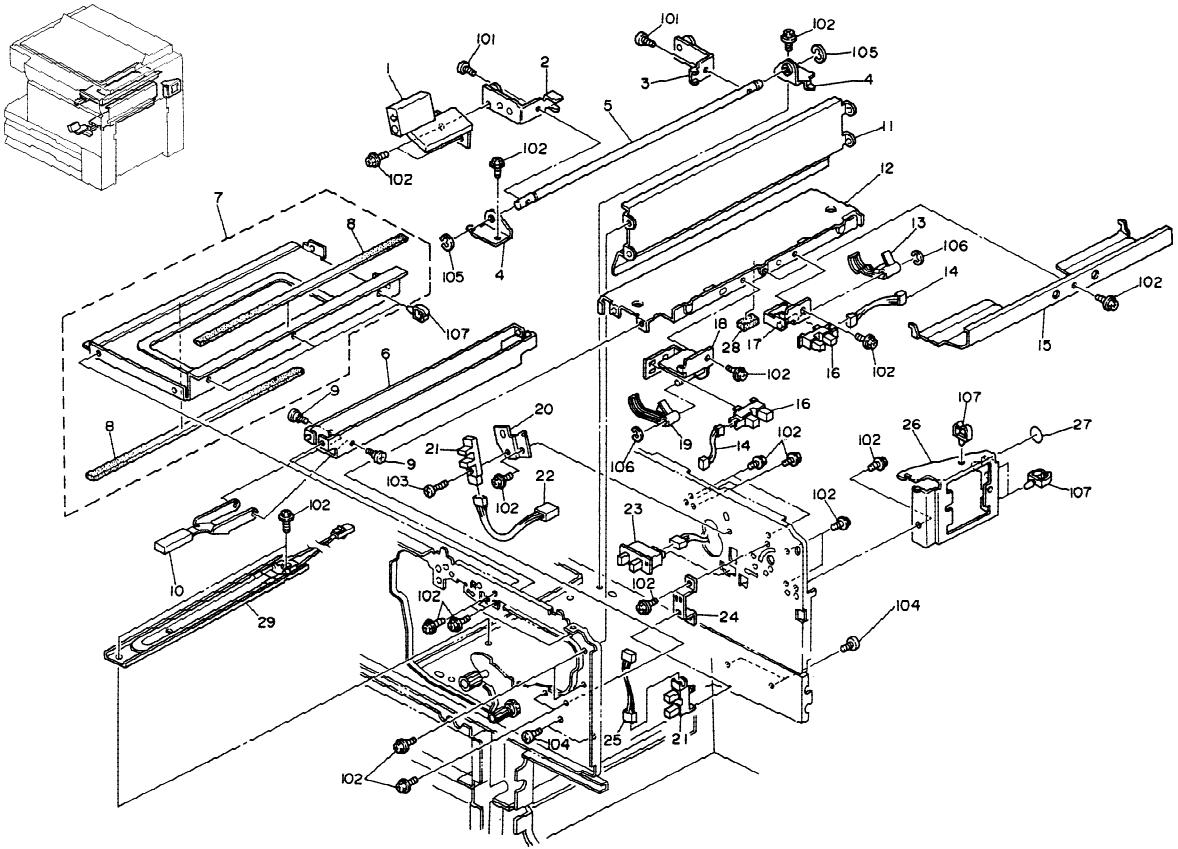
22. DUPLEX UNIT - II 220/240V (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A491 5306	Duplex Harness	1
2	A491 5205	Transport Motor - DC30V	1
3	A491 5101	Duplex Main Board	1
4	A491 5301	Sensor Harness	1
5	A491 5210	Jog Motor - DC24V	1
6	A491 4660	Jog Sensor Bracket	1
7	AW02 0022	Photointerruptor	1
8	A491 4890	Harness Clamp Plate	6
9	AF01 7005	End Jog Fence	1
10	A491 4650	Jog Registration Plate	1
11	AF01 6026	Front Jog Fence	1
12	AF01 6027	Rear Jog Fence	1
13	AA14 3269	Guide Pin - M6	2
14	A491 4690	Bottom Plate Hook	1
15	AA06 0257	Spring - Bottom Plate Clutch	1
16	AA14 0291	Bottom Plate Shaft	1
17	A491 4695	Pressure Plate - Bottom Plate	1
18	AG07 0004	Magnet Catch Ass'y	2
19	A491 4685	Bottom Plate	1
20	AF01 3002	Bottom Plate Pad	1
21	A491 4611	Duplex Tray	1
22	AB01 7165	Gear - 16Z/22Z	1
23	A491 4640	Side Fence Rack	2
24	A491 4630	Bottom Cover	1
25	AB01 7164	Gear - 21Z/64Z	1
26	A491 4645	End Fence Rack	1
27	A491 4951	Front Cover	1
28	AA16 2035	Cushion - Paper Tray	1
29	A491 4634	Dust Cover	1
30	A491 4915	Dust Cover Decal	1
31	A491 4647	Cushion - Side Fence Rack	3
32	A491 4686	Cushion - Tray Bottom Plate	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0313 0050W	Philips Pan Head Screw - M3x5	
102	0313 0060W	Philips Pan Head Screw - M3x6	
103	0314 0100W	Philips Pan Head Screw - M4x10	
104	0343 0060W	Philips Pan Head Screw - M3x6	
105	0344 0080F	Philips Truss Head Screw - M4x8	
106	0413 0062W	Tapping Screw - M3x6	
107	0434 0122W	Pan Head Self-tapping Screw - M4x12	
108	0951 3005W	Philips Screw With Flat Washer - M3x5	
109	0720 0040E	Retaining Ring - M4	
110	0805 0073	Retaining Ring - M5	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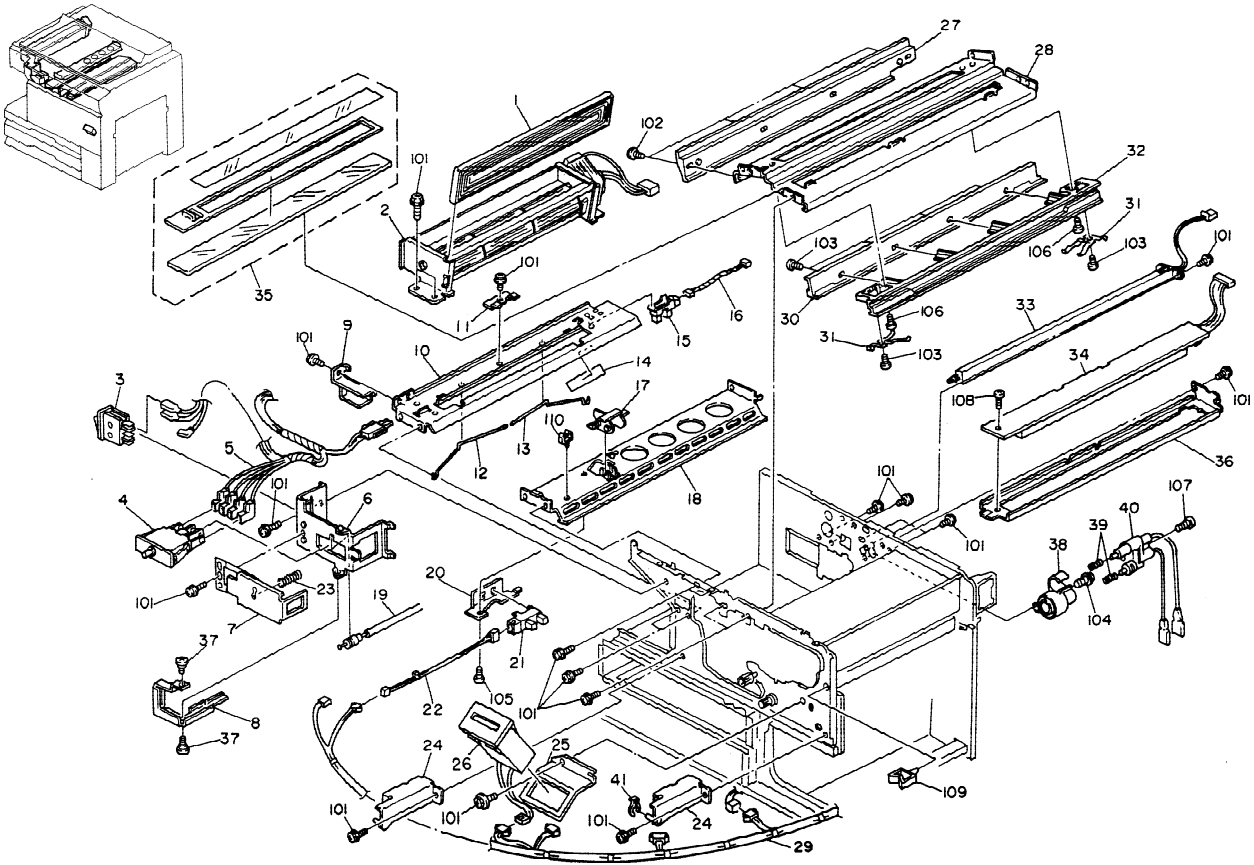
23. FRAME I (054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 3873	Release Lever	1
2	A048 3869	Front Release Bracket	1
3	A048 3871	Rear Release Bracket	1
4	A048 3868	Releas Bracket	2
5	AA14 0294	Transport Release Shaft	1
6	A048 7688	Stopper Guide	1
7	A054 1070	5th Mirror Cover Ass'y	1
8	AA15 0194	Seal - Shielding Plate	2
9	AA14 3037	Development Cover Screw	2
10	A048 7685	Development Stopper	1
11	A048 7693	Development Cover	1
12	A048 2623	Upper Guide Plate	1
13	AA11 1009	Paper End Feeler	1
14	A048 5321	Harness - Paper End	1
15	A048 2621	Upper Entrance Guide	1
16	AW02 0021	Photointerruptor	1
17	A048 2637	Paper Sensor Bracket	1
18	A048 2632	Paper End Sensor Bracket	1
19	AA11 1008	Paper End Feeler	1
20	A048 7681	Sensor Bracket	1
21	AW02 0022	Photointerruptor	1
22	A048 5324	Harness - Toner End Sensor	1
23	AW50 0011	Push Switch	1
24	A048 7683	Bracket - Photointerruptor	1
25	A048 5323	Harness - Development Unit	1
26	A048 1301	Key Counter Bracket	1
27	5205 1853	Mylar Seal - Base	5
28	A048 2624	Cushion - Pick-up Roller	1
29	AX40 0021	Anti Condensation Heater - 115V 18W	1
29	AX40 0022	Anti Condensation Heater - 240V 18W	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0314 0060W	Philips Pan Head Screw - M4x6	
102	0443 0060W	Hexagon Head Tapping Screw - M3x6	
103	0314 0100W	Philips Pan Head Screw - M4x10	
104	0413 0082W	Tapping Screw - M3x8	
105	0720 0080E	Retaining Ring - M8	
106	0720 0030E	Retaining Ring - M3	
107	1105 0230	Clamp	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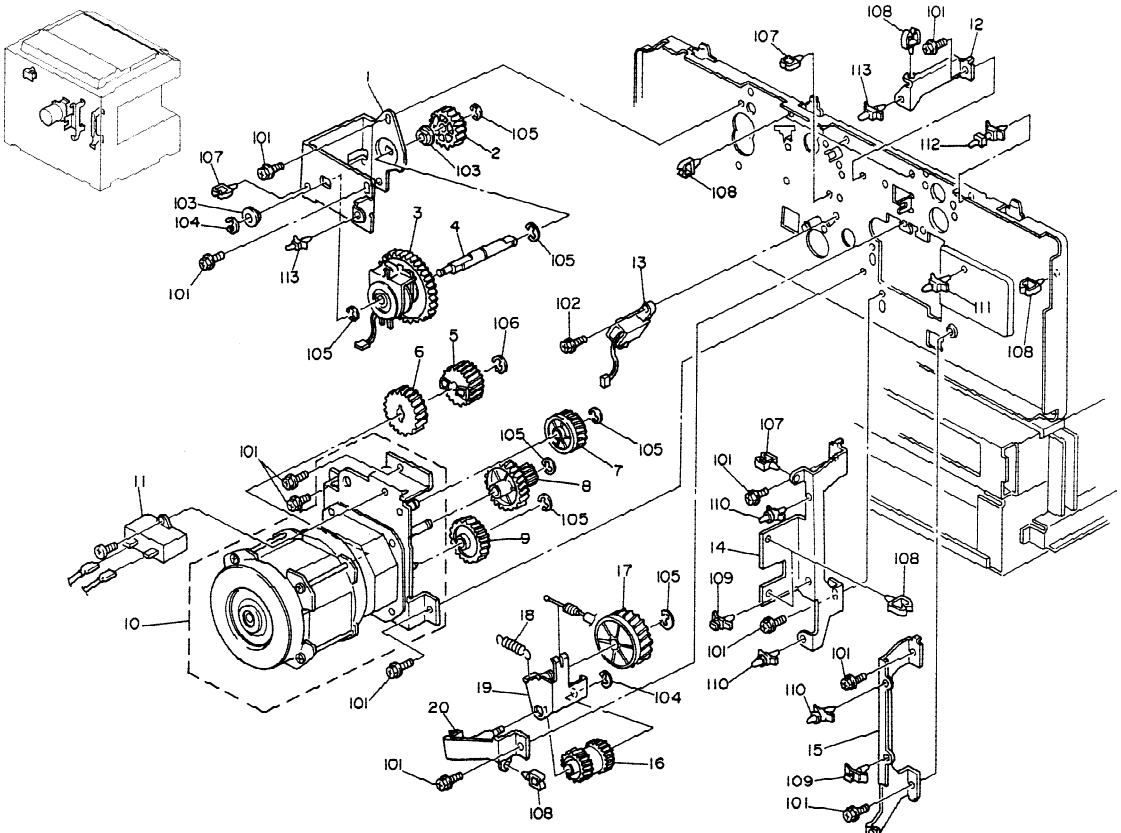
24. FRAME II (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	AA01 0015	Ozone Filter	1
2	AX62 0015	Fan Motor - 115V	1
2	AX62 0016	Fan Motor - 220V/50Hz	1
3	1204 1576	Main Switch	1
4	1204 1373	Push Switch	1
5	A054 5316	AC Harness	1
6	A048 5821	Switch Bracket	1
7	A048 5823	Switch Arm	1
8	A048 5822	Switch Lever	1
9	A048 4390	Switch Cover	1
10	A048 1092	Fan Motor Bracket	1
11	A048 1095	Support Spring Plate	1
12	A048 1096	Front Spring Plate	1
13	A048 1097	Rear Spring Plate	1
14	5216 4145	Thermofuse Decal	1
15	AW02 0021	Photointerruptor	1
16	A048 5325	Harness - Exit Sensor	1
17	A006 3676	Sensor Shutter	1
18	A048 3595	Upper Cleaning Stay	1
19	AA05 1013	Release Wire	1
20	A048 3596	Sensor Bracket	1
21	AW02 0022	Photointerruptor	1
22	A048 5310	Harness - Over Flow	1
23	AA06 3144	Spring - Inter Lock Switch	1
24	A048 1302	Cover Hinge	2
25	A048 5830	Counter Bracket	1
26	AX31 0010	6 Digits Total Counter	1
27	A048 2056	Cleaning Rail	1
28	A048 2052	Charge Corona Guide	1
29	A048 5319	Harness - Right Front	1
30	A048 2053	Left Charge Corona Rail	1
31	A006 2130	Spring Plate - Charge Corona	2
32	A048 2054	Right Charge Corona Rail	1
33	A048 5410	Quenching Lamp - 115V	1
33	A048 5610	Quenching Lamp - 220/240V	1
34	A048 5275	Eraser	1
35	A048 1875	Dust Proof Glass	1
36	A048 2061	Eraser Bracket	1
37	5203 1686	Screw - Slid Rail	2
38	AD02 1015	Receptacle Housing	1
39	5442 2107	Hookless Spring	2
40	AD02 1013	Charge Corona Receptacle	1
41	5206 2686	Snap Ring	1
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0951 4006W	Philips Screw With Flat Washer - M4x6	
103	0413 0082W	Tapping Screw - M3x8	
104	0964 4008W	Tapping Screw with Flat Washer - M4x8	
105	0313 0060W	Philips Pan Head Screw - M3x6	
106	0414 0082W	Tapping Screw with Flat Washer - M4x8	
107	0413 0062W	Tapping Screw - M3x6	
108	0313 0050W	Philips Pan Head Screw - M3x5	
109	1105 0230	Clamp	
110	1105 0199	Clamp	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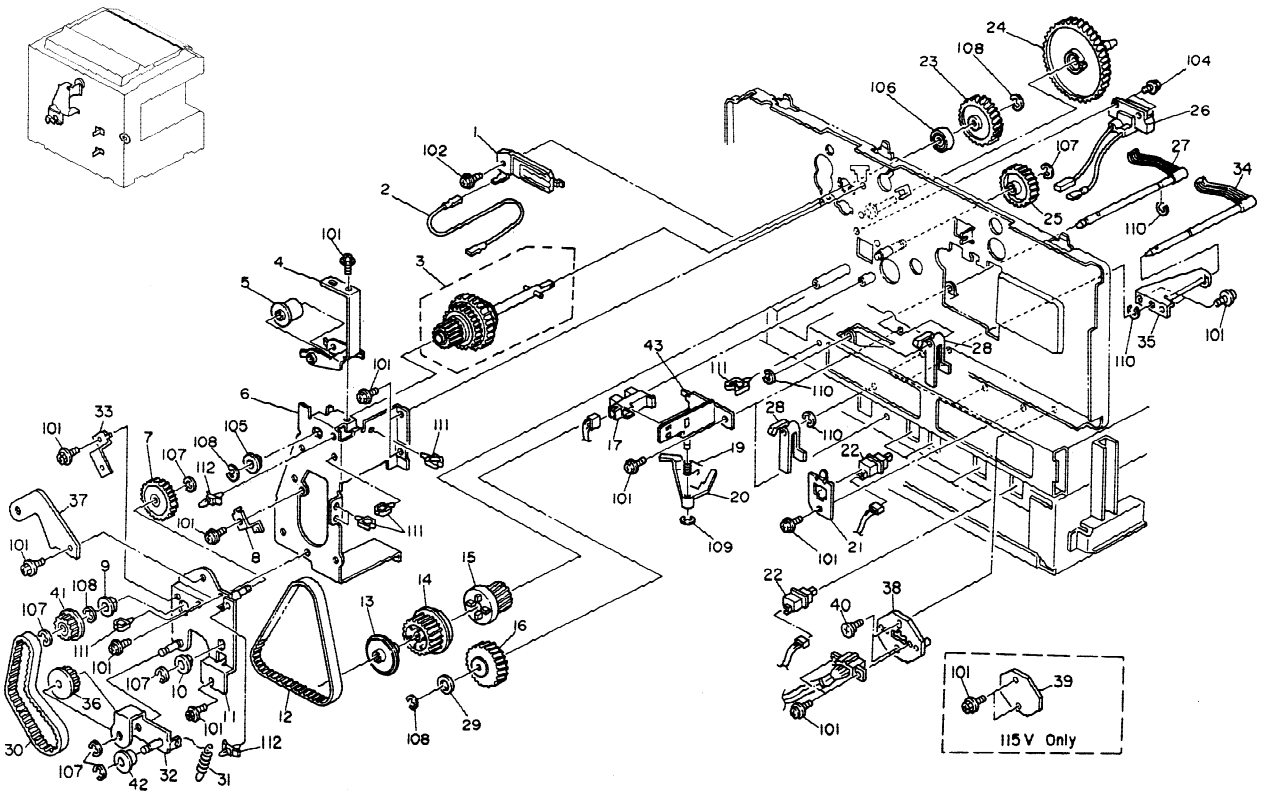
25. DRIVE SECTION I (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 1135	Toner Supply Cover	1
2	AB01 3429	Gear - 26Z	1
3	A048 5263	Toner Supply Clutch	1
4	AA14 8301	Toner Supply Shaft	1
5	AB01 1069	Gear - 45Z	1
6	AB01 3392	Gear - 36Z	1
7	AB01 3431	Gear - 29Z	1
8	AB01 7166	Gear - 36Z And 20Z	1
9	AB01 3430	Gear - 33Z	1
10	AX02 0047	Motor - 115V 60Hz 31W	1
10	AX02 0048	Motor - 220V 50Hz 31W	1
11	1606 1828	Capacitor	1
12	A048 5856	Power Pack Bracket	1
13	A048 5306	P.Sensor Harness	1
14	A048 5852	Right AC Drive Board Bracket	1
15	A048 5853	Left AC Drive Board Bracket	1
16	AB01 7167	Gear - 20Z	1
17	AB01 3432	Gear - 35Z	1
18	5203 3151	Roller Cover Spring	1
19	A048 1123	Fusing Drive Joint Bracket	1
20	A048 1126	Fusing Drive Bracket	1

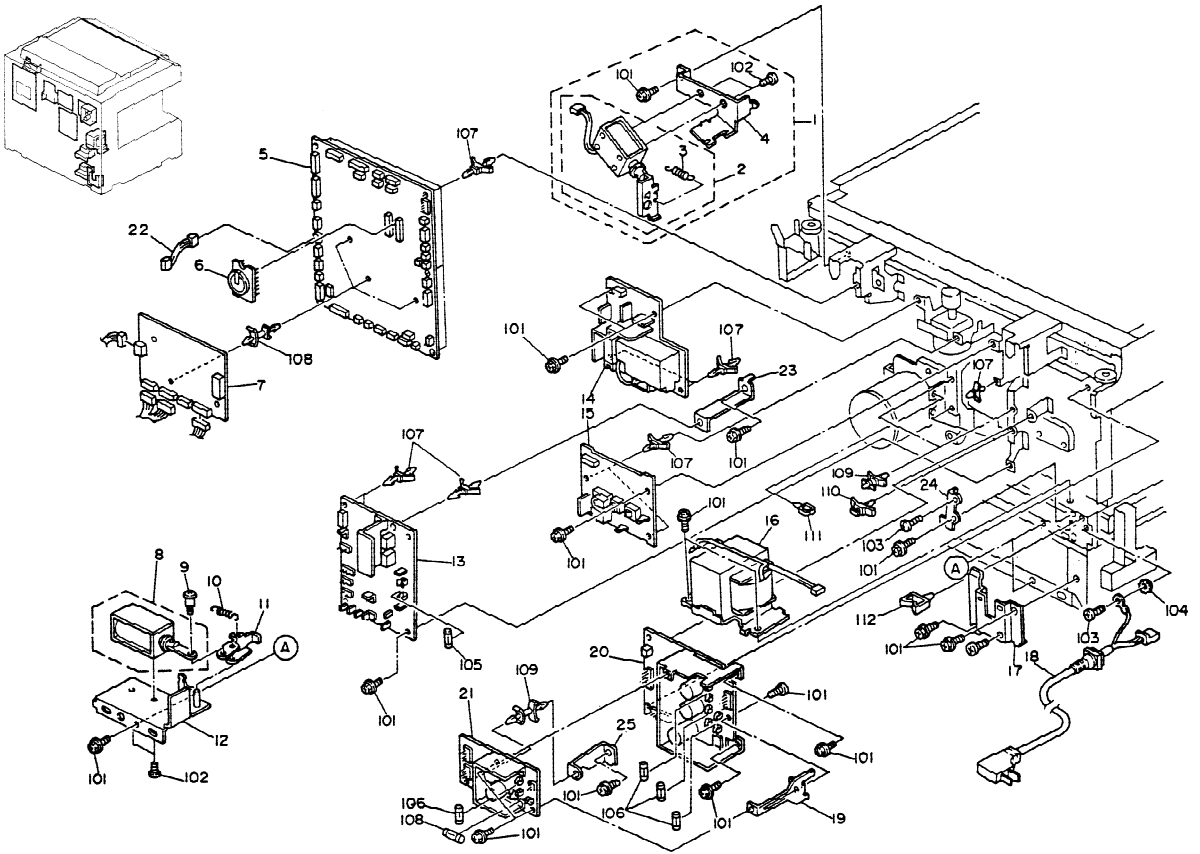
Index No.	Part No.	Description	Q'ty per Assembly
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0443 0080W	Hexagon Head Tapping Screw - M3x8	
103	0805 3384	Bushing - 5mm	
104	0720 0040E	Retaining Ring - M4	
105	0720 0060E	Retaining Ring - M6	
106	0720 0080E	Retaining Ring - M8	
107	1105 0199	Clamp	
108	1105 0230	Clamp	
109	1105 0183	Spacer	
110	1105 0193	Nylon Stud	
111	1105 0160	Clamp	
112	1105 0162	Locking Support	
113	1109 0159	PCB Stud	


115 V Only

26. DRIVE SECTION II (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 7637	Bias Terminal	1
2	A048 5340	Harness - High Voltage	1
3	AB04 0007	Development Drive Clutch	1
4	A048 1129	Spring Plate	1
5	A048 1139	Roller	1
6	A048 1138	Rear 2nd Plate	1
7	AB01 3423	Gear - 26T	1
8	A048 2556	Registration Clutch Holder	1
9	5053 0223	Bushing - 8mm	8
10	5053 0447	Bushing - 6mm	5
11	A054 2985	Paper Feed Bracket	1
12	AA04 3088	Timing Belt - 384XL	1
13	A048 1115	Timing Pulley Flange	1
14	AB03 0195	Pulley - 36Z	1
15	AB01 3435	Gear - 24Z	1
16	AB01 3434	Gear - 35Z	1
17	AW02 0021	Photointerruptor	1
18	A048 2861	Paper End Sensor Bracket	1
19	AA06 6104	Release Arm Spring	1
20	A048 2863	Release Arm - Paper End	1
21	A048 2834	Paper Size Sensor Bracket	4
22	AW50 0012	Push Switch	6
23	AB01 3428	Gear - 36Z	1
24	AB01 1067	Gear - 100Z	1
25	AB01 1068	Gear - 46Z	1
26	AD02 1059	T/S Corona Receptacle	1
27	A048 2860	Paper End Feeler	1
28	A048 2865	Paper End Actuator	1
29	AA13 2025	Seal - 1x8x12	1
30	AA04 3111	Timing Belt	1
31	AA06 3161	Tightener Spring	1
32	A054 2978	Paper Feed Harness Bracket	1
33	A054 2987	Bracket - Feed - Harness	1
34	A312 2612	Paper End Feeler	1
35	A312 2611	Bracket - Paper End Feeler	1
36	AB03 0264	Pulley	1
37	A048 2714	Paper Lift Clutch Support Bracket	1
38	A491 4835	Connector Bracket	1
39	A048 1145	Connector Cover	1
40	AA14 3070	Shoulder Screw - M2x2	5
41	AB01 3106	Gear - Drive - Third - Z18	1
42	AB03 0263	Pulley	1
43	A048 2861	Paper End Sensor Bracket	1
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0443 0100W	Hexagon Head Tapping Screw - M3x10	
103	0951 3006W	Philips Screw With Flat Washer - M3x6	
104	0443 0080W	Hexagon Head Tapping Screw - M3x8	
105	0805 3386	Bushing - 8mm	
106	0805 3104	Ball Bearing - 8x22x7mm	
107	0720 0040E	Retaining Ring - M4	
108	0720 0060E	Retaining Ring - M6	
109	0720 0025E	Retaining Ring - M2.5	
110	0720 0030E	Retaining Ring - M3	
111	1105 0199	Clamp	
112	1105 0159	PCB Stud	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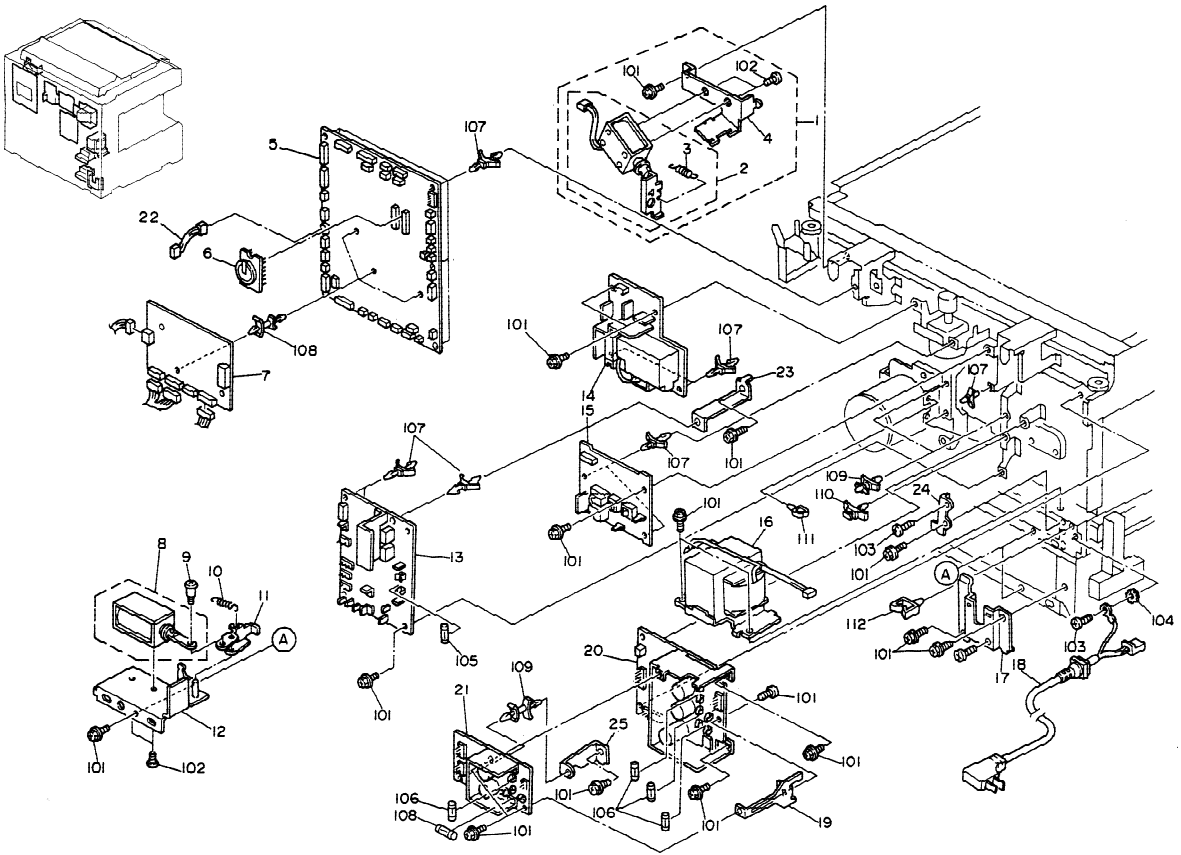
27. ELECTRICAL SECTION - 115V (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 1102	Development Drive Solenoid Ass'y	1
2	A048 1134	Development Drive Solenoid	1
3	5203 3127	Toner End Spring	1
4	A048 5869	Development Drive Bracket	1
5	A054 5102	Main Board	1
6	A008 5112	Ram Board	1
7	A054 5105	Interface Board	1
8	A048 2874	Tray Lock Solenoid	1
9	5840 3022	Stopper Screw - M3	2
10	AA06 0266	Setting Spring	1
11	A048 2872	Lock Lever	1
12	A048 2870	Tray Lock Solenoid Bracket	1
13	A048 5520	AC Drive Board - 115V	1
14	AZ32 0037	Power Pack - T/D - 115V	1
15	AZ32 0036	Power Pack - C/B/G	1
16	AZ13 0014	Transformer - 115V	1
17	A054 5850	Power Supply Cord Bracket	1
18	A048 5571	Power Supply Cord - 115V	1
19	A494 5801	Small P.S.U Braket	1
20	A054 5402	DC Power Supply Board - 115V	1
21	A054 5415	DC Drive Board - 115 V	1
22	A048 5312	Harness - Key Countor	1
23	A048 5854	Upper AC Drive Board Braket	1
24	A054 1388	Rear Cover Braket	1
25	A054 5810	Large P.S.U Braket	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0313 0040W	Philips Pan Head Screw - M3x4	
103	0315 0080M	Philips Pan Head Screw - M5x8	
104	0705 0050C	Toothed Washer - M5	
105	1107 0486	Fuse - 8A, 250V	
106	1107 0354	Fuse - 3.15A/125V	
107	1105 0159	PCB Stud	
108	1107 0391	Fuse - 5A, 125V	
109	1105 0193	Nylon Stud	
110	1105 0183	Spacer	
111	1105 0199	Clamp	
112	1105 0230	Clamp	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28. ELECTRICAL SECTION - 220/240V (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 1102	Development Drive Solenoid Ass'y	1
2	A048 1134	Development Drive Solenoid	1
3	5203 3127	Toner End Spring	1
4	A048 5869	Development Drive Bracket	1
5	A054 5102	Main Board	1
6	A008 5112	Ram Board	1
7	A054 5105	Interface Board	1
8	A048 2874	Tray Lock Solenoid	1
9	5840 3022	Stopper Screw - M3	2
10	AA06 0266	Setting Spring	1
11	A048 2872	Lock Lever	1
12	A048 2870	Tray Lock Solenoid Bracket	1
13	A048 5620	AC Drive Board - 220/240V	1
14	AZ32 0038	Power Pack - T/D - 220/240V	1
15	AZ32 0036	Power Pack - C/B/G	1
16	AZ13 0015	Transformer - 220/240V	1
17	A054 5850	Power Supply Cord Bracket	1
18	A048 5671	Power Supply Cord - 220/240V	1
19	A494 5801	Small P.S.U. Bracket	1
20	A054 5412	DC Power Supply Board - 220/240V	1
21	A054 5416	DC Drive Board - 220/240V	1
22	A048 5312	Harness - Key Countor	1
23	A048 5854	Upper AC Drive Board Bracket	1
24	A054 1388	Rear Cover Bracket	1
25	A054 5810	Large P.S.U. Bracket	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	0313 0040W	Philips Pan Head Screw - M3x4	
103	0315 0080M	Philips Pan Head Screw - M5x8	
104	0705 0050C	Toothed Washer - M5	
105	1107 0486	Fuse - 8A, 250V	
106	1107 0354	Fuse - 3.15A/125V	
107	1105 0159	PCB Stud	
108	1107 0391	Fuse - 5A, 125V	
109	1105 0193	Nylon Stud	
110	1105 0183	Spacer	
111	1105 0199	Clamp	
112	1105 0230	Clamp	

CAPACITOR

SYMBOL NO.	INDEX NO.
C101	159
C102	160
C103	160
C104	157
C105	166
C106	166
C107	165
C108	165
C109	158
C111	165
C112	161

SYMBOL NO.	INDEX NO.
C113	161
C114	156
C115	156
C116	165
C117	166
C118	166
C119	166
C120	166
C121	165
C124	165

SYMBOL NO.	INDEX NO.
C125	165
C126	165
C127	165
C128	165
C129	165
C130	162
C131	165
C137	165
C138	165
C139	165

SYMBOL NO.	INDEX NO.
C140	163
C141	164
C142	164
C143	165
C144	165
C145	165
C146	165
C148	166
C149	164
C150	165

SYMBOL NO.	INDEX NO.
C151	165
C152	165
C153	165
C154	165
C155	164
C156	166
C157	166
C158	164
C159	164
C160	166

SYMBOL NO.	INDEX NO.
C161	165
C162	164
C163	162
C164	166
C165	166
C166	165

CONNECTOR

SYMBOL NO.	INDEX NO.
CN101	110
CN102	111
CN103	104
CN104	104
CN105	122
CN106	107
CN107	102
CN108	117
CN109	109
CN110	105

SYMBOL NO.	INDEX NO.
CN111	117
CN112	108
CN113	104
CN114	115
CN115	109
CN116	104
CN117	108
CN118	116
CN119	117
CN120	104

SYMBOL NO.	INDEX NO.
CN121	114
CN122	119
CN123	105
CN124	116
CN125	107
CN126	106
CN127	120
CN128	104
CN129	124
CN130	113

SYMBOL NO.	INDEX NO.
CN131	112
CN132-1	3
CN132-2	103
CN133	118
CN135	123
CN136	121
CN137	186
CN138	114
CN139	106
CN141	105

DIODE

SYMBOL NO.	INDEX NO.
D101	133
D102	133
D106	130
D107	130
D108	130
D109	130
D110	130
D111	130
D113	131

SYMBOL NO.	INDEX NO.
D114	132
D115	130
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D118	130
D119	130
D121	130
D122	130
D123	131
D124	131

DIP SWITCH

SYMBOL NO.	INDEX NO.
DPS101	126

IC

SYMBOL NO.	INDEX NO.
IC101	148
IC102	155
IC103	143
IC104	143
IC105	147
IC106	142
IC107	142
IC108	142
IC109	144
IC110	137

SYMBOL NO.	INDEX NO.
IC111	2
(SOCKET)	125
IC112	146
IC113	141
IC114	141
IC115	140
IC116	136
IC117	149
IC118	135
IC119	134
IC121	150

SYMBOL NO.	INDEX NO.
IC122	145
IC123	1
(SOCKET)	185
IC124	147
IC125	138
IC126	144
IC127	139
IC128	143
IC129	141

OSCILLATOR

SYMBOL NO.	INDEX NO.
OSC101	151

TRANSISTOR

SYMBOL NO.	INDEX NO.
Q102	127
Q103	127
Q104	127
Q105	127
Q106	127
Q107	127
Q108	127
Q109	127
Q110	127
Q111	128

RESISTOR

SYMBOL NO.	INDEX NO.
R101	152
R102	152
R103	174
R104	174
R105	174
R106	174
R107	174
R108	174
R109	174
R110	174

SYMBOL NO.	INDEX NO.
R111	174
R112	174
R113	174
R114	172
R115	181
R116	183
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SYMBOL NO.	INDEX NO.
R121	172
R122	172
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SYMBOL NO.	INDEX NO.
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SYMBOL NO.	INDEX NO.
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SYMBOL NO.	INDEX NO.
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SYMBOL NO.	INDEX NO.
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R174	171

SYMBOL NO.	INDEX NO.
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R184	174

SYMBOL NO.	INDEX NO.
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R193	170
R194	171

SYMBOL NO.	INDEX NO.
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R199	174
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R202	178
R203	178
R204	178

SYMBOL NO.	INDEX NO.
R205	178
R206	178
R207	178
R208	176
R210	176
R211	169
R212	180
R213	168
R214	173
R215	173

SYMBOL NO.	INDEX NO.
R216	179
R217	179
R218	161
R222	175
R223	176
R224	175

TEST PIN

SYMBOL NO.	INDEX NO.
TP101	101
TP102	101
TP103	101
TP104	101
TP105	101
TP106	101
TP107	101
TP108	101
TP109	101
TP110	101

SYMBOL NO.	INDEX NO.
TP111	101
TP112	101

VARIABLE RESISTOR

SYMBOL NO.	INDEX NO.
VR101	154
VR102	153

ZENER DIODE

SYMBOL NO.	INDEX NO.
ZD101	129
ZD102	129

29. MAIN BOARD (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A054 5102	Main Board	1
1	A054 5103	IC - CPU	1
2	A054 5104	ROM	1
3	A008 5112	Ram Board	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1101 0328	Test Pin	
102	1102 0675	Connector - 6P	
103	1102 2985	Receptacle - 12P	
104	1102 4201	CT Header - 2P	
105	1102 4202	CT Header - 3P	
106	1102 4204	CT Header - 5P	
107	1102 4205	Connector - 6P	
108	1102 4207	CT Header - 8P	
109	1102 4208	CT Header - 9P	
110	1102 4209	CT Header - 10P	
111	1102 4211	CT Header - 12P	
112	1102 4212	CT Header - 15P	
113	1102 4497	Connector - 13P	
114	1102 4619	CT Header - 2P	
115	1102 4625	CT Connector 8P	
116	1102 4631	CT Connector 2P	
117	1102 4643	CT Connector 2P	
118	1102 5002	Connector 30P	
119	1102 5007	CT Header - 14P	
120	1103 1770	Connector - 4P	
121	1103 1771	Connector - 5P	
122	1103 1772	Pin Header - 6P	
123	1102 4626	Connector - 9P	
124	1103 1798	Pin Header - 4P	
125	1104 0588	DIP Socket - 28P	
126	1204 1422	DIP Switch	
127	1400 0369	Transistor - 2SA1213Y	
128	1401 0298	Transistor - 2SC2712Y	
129	1402 0277	Zener Diode - 1Z12	
130	1402 0476	Diode - 1SS184	
131	1402 0478	Diode - 1SS226TE85L	
132	1402 0804	Diode - 1SS294	
133	1402 0513	Diode - EK03	
134	1407 1741	IC - SN74LS32NS	
135	1407 1772	IC - SN74HC04NS	

Index No.	Part No.	Description	Q'ty per Assembly
136	1407 1813	IC - SN74LS11NS	
137	1407 1882	IC - SN74LS373NS	
138	1407 2054	IC - TD62308F	
139	1407 2055	IC - TD62304F	
140	1407 2077	IC - SN74LS138NS	
141	1407 2187	IC - SN74LS07NS	
142	1407 2230	IC - TD6F62303F	
143	1407 2231	IC - TD62308AF	
144	1407 2344	Transistor Array - TD62382F	
145	1407 3381	IC - TC74HC4066AF	
146	1407 3533	IC - TC74HC241AF	
147	1407 2746	IC - CXD1095Q	
148	1407 3422	IC - SLA7024M	
149	1408 0537	IC - TL7705CPS	
150	1408 0604	IC - UPC393	
151	1503 0071	Oscillator - 12MHz	
152	1600 1295	Resistor - 0.82 Ω 2W ±5%	
153	1601 8171	Variable Resistor - 2k Ω ±20%	
154	1601 8445	Resistor - 200K Ω 0.3W	
155	1602 7032	Noise Filter - 2200pF 250V 7A	
156	1604 1353	Capacitor - 47uF 10V	
157	1604 2154	Capacitor - 2200uF ±20% 16V	
158	1604 1381	Capacitor - 4.7uF 50V	
159	1604 1382	Capacitor - 10uF 50V	
160	1604 1386	Capacitor - 100mF 50V	
161	1610 0057	Resistor - 1.5k Ω 1/8W ±5%	
162	1605 0355	Capacitor - 2200pF 2kV	
163	1606 0286	Capacitor - 100pF ±5% 50V	
164	1606 1451	Capacitor - 0.1uF 50V	
165	1606 1454	Capacitor - 0.01uF 50V	
166	1606 1455	Capacitor - 470pF 25V	
167	1610 0025	Resistor - 22 Ω 1/8W ±5%	
168	1610 0035	Resistor - 100 Ω 1/8W ±5%	
169	1610 0048	Resistor - 390 Ω 1/8W ±5%	
170	1610 0049	Resistor - 470 Ω 1/8W ±5%	

Index No.	Part No.	Description	Q'ty per Assembly
171	1610 0050	Resistor - 560 Ω 1/8W ±5%	
172	1610 0053	Resistor - 1k Ω 1/8W ±5%	
173	1610 0062	Resistor - 2.4 Ω ±5% 1/8W	
174	1610 0063	Resistor - 2.7k Ω 1/8W	
175	1610 0067	Resistor - 4.7k Ω 1/8W ±5%	
176	1610 0071	Resistor - 10k Ω 1/8W ±5%	
177	1610 0079	Resistor - 22k Ω 1/8W ±5%	
178	1610 0083	Resistor - 33k Ω 1/8W ±5%	
179	1610 0085	Resistor - 47k Ω 1/8W ±5%	
180	1610 0337	Resistor - 510 Ω ±5% 1/8W	
181	1611 4101	Resistor - 100 Ω 1/4T ±5%	
182	1611 4106	Resistor - 10M Ω ±5% 1/4T	
183	1622 1001	Resistor - 1k Ω 1/4T ±1%	
184	1622 1301	Resistor - 1.3k Ω 1/4T ±10%	
185	1104 0370	IC Socket - 64P	
186	1102 4628	Connector - 11P	

CAPACITOR

SYMBOL NO.	INDEX NO.
C100	116
C101	114
C103	115
C104	121
C105	120
C106	117
C107	114
C108	115
C109	121
C110	118
C111	121
C112	119
C113	119
C114	119

CONNECTOR

SYMBOL NO.	INDEX NO.
CN100	101
CN101	101
CN102	102
CN103	103

DIODE

SYMBOL NO.	INDEX NO.
D100	108
D101	108
D102	107
D103	107
D104	107
D105	107

FUSE

SYMBOL NO.	INDEX NO.
FU100	
(150V)	105
(220/240V)	104
(Holder)	128
FU101	
(150V)	105
(220/240V)	104
(Holder)	128
FU102	
(150V)	105
(220/240V)	104
(Holder)	128

IC

SYMBOL NO.	INDEX NO.
IC100	110
IC101	111

TRANSISTOR

SYMBOL NO.	INDEX NO.
Q101	106

RESISTOR

SYMBOL NO.	INDEX NO.
R100	126
R101	127
R102	123
R103	125
R104	113
R105	122
R106	124
R107	126
R108	112

RECTIFIER

SYMBOL NO.	INDEX NO.
ST100	109
ST101	109
ST102	109

30. DC DRIVE BOARD (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A054 5402	DC Power Supply Board - 115V	1
*	A054 5412	DC Power Supply Board - 220/240V	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1102 0675	Connector - 6P	
102	1102 4201	CT Header - 2P	
103	1103 0725	Connector - 3P	
104	1107 0457	Fuse - 3.15A 250V	
105	1107 0354	Fuse - 3.15A/125V	
106	1400 0208	Transistor - 2SC945	
107	1402 0388	Diode - W03C	
108	1402 0467	Diode - S5566G	
109	1402 0601	Rectifier - RBV-401	
110	1408 0569	IC - NJM78M05F-A	
111	1408 0753	IC - NJM78M24FA	
112	1600 0678	Resistor - 4.7k Ω 1W	
113	1600 0681	Resistor - 510 Ω ±5% 1W	
114	1604 1378	Capacitor - 1mF 50V	
115	1604 1382	Capacitor - 10uF 50V	
116	1604 2277	Capacitor - 10000uF 25V	
117	1604 2289	Capacitor - 4700uF ±20% 50V	
118	1604 2240	Capacitor - 3300uf 63V	
119	1606 0996	Capacitor - 470pF 50V	
120	1606 1336	Capacitor - 10000pF -20% +80% 50V	
121	1606 1396	Capacitor - 0.1uF 25V	
122	1611 4123	Resistor - 12k Ω 1/4T ±5%	
123	1611 4220	Resistor - 22 Ω 1/4T ±5%	
124	1611 4223	Resistor - 22k Ω 1/4T ±5%	
125	1611 4472	Resistor - 4.7k Ω ±5% 1/4W	
126	1611 4689	Resistor - 6.8 Ω 1/4T ±5%	
127	1611 6102	Resistor - 1k Ω 1/2T +5%	
128	1104 0351	Fuse Holder	

CAPACITOR

SYMBOL NO.	INDEX NO.
C401	126
C411	128
C412	127
C413	127

CONNECTOR

SYMBOL NO.	INDEX NO.
CN401	107
CN411	106
CN413	110
CN415	110
CN417	104
CN418	108
CN419	109
CN420	103

NOISE KILLER

SYMBOL NO.	INDEX NO.
CR401	125
CR402	125
CR403	137
CR404	137

DIODE

SYMBOL NO.	INDEX NO.
D401	115
D452	135

RECTIFIER

SYMBOL NO.	INDEX NO.
DB401	121

FUSE

SYMBOL NO.	INDEX NO.
FU401	112
(FU401)	111

COIL

SYMBOL NO.	INDEX NO.
L401	129

PHOTOCOUPLER

SYMBOL NO.	INDEX NO.
PC401	120
PC402	120

RESISTOR

SYMBOL NO.	INDEX NO.
R401	122
R402	122
R403	132
R404	131
R405	130
R406	133
R411	123
R412	123
R413	134
R414	134

RELAY

SYMBOL NO.	INDEX NO.
RA401	113
RA402	114

PIN

SYMBOL NO.	INDEX NO.
T401	102
T402	101
T403	101
T404	101
T405	101
T406	101
T407	101

TRANSFORMER

SYMBOL NO.	INDEX NO.
TR401	1

TRIAC

SYMBOL NO.	INDEX NO.
TRC401	2
TRC402	3

VARIABLE RESISTOR

SYMBOL NO.	INDEX NO.
VR401	124

VARISTOR

SYMBOL NO.	INDEX NO.
B401	136

ZENER DIODE

SYMBOL NO.	INDEX NO.
ZD401	118
ZD402	119
ZD403	117
ZD404	116

31. AC DRIVE BOARD - 115V (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A048 5520	AC Drive Board - 115V	1
1	AZ10 0001	Transformer - 100,115V/13V	1
2	1405 0211	Triac - 400V 16A	1
3	1405 0210	Triac - 400V 10A	1
101	1100 0657	Fastening Tab	

Index No.	Part No.	Description	Q'ty per Assembly
102	1100 1575	Fastening Tab	
103	1102 0484	Connector - 3P	
104	1102 0959	Connector - 3P	
106	1102 3601	Connector - 2P	
107	1102 4208	CT Header - 9P	
108	1102 4868	Connector - 3P - Black	
109	1103 1445	Wafer - 2P	
110	1103 1446	Wafer - 2P	
111	1104 0375	Fuse Holder	
112	1107 0485	Fuse - 15A, 125V	
113	1208 1277	Relay - AC250V 16A	
114	1208 1279	Relay - AC250V 5A	
115	1401 0612	Diode - 1S1585	
116	1402 0407	Zener Diode - HZ-6B3	
117	1402 0416	Zener Diode - HZ58 - 1	
118	1402 0433	Zener Diode - HZ982 - 9	
119	1402 0539	Zener Diode - HZ9C - 2	
120	1403 0614	Photo Triac - PB01AP-8	
121	1405 0129	Rectifier - 100V 1.0A IB4B42	
122	1600 1148	Registor - 1kΩ +/-5% 1W	
123	1601 1880	Fuse Resistor 100Ω 1/2W	
124	1601 8138	Variable Resistor - 30k Ω 0.75W	
125	1602 0895	Noise Killer - 0.1mF, 120 Ω	
126	1604 1378	Capacitor - 1mF 50V	
127	1606 1121	Capacitor - 0.1uF 25V	
128	1606 1472	Capacitor - 0.1uF ±20%	
129	1607 0054	Noise Filter - SN14-700	
130	1611 4103	Resistor - 10k Ω 1/4T ±5%	
131	1611 4153	Resistor - 15k Ω 1/4T ±5%	
132	1611 4223	Resistor - 22k Ω 1/4T ±5%	
133	1611 4242	Resistor - 2.4k Ω 1/4T ±5%	
134	1611 4820	Resistor - 82 Ω 1/4T ±5%	
135	1401 0815	Diode - 1S1588	
136	1404 0131	Varistor - ERZ-CIODK271U	
137	1602 0908	Noise Killer	

CAPACITOR

SYMBOL NO.	INDEX NO.
C401	127
C411	129
C412	128
C413	128
C451	130

CONNECTOR

SYMBOL NO.	INDEX NO.
CN401	107
CN411	106
(CN411)	105
CN413	110
CN415	110
CN417	104
CN418	108
CN419	109
CN420	103
CN421	104

SYMBOL NO.	INDEX NO.
CN425	1

NOISE KILLER

SYMBOL NO.	INDEX NO.
CR401	126
CR402	126
CR403	139
CR404	139

DIODE

SYMBOL NO.	INDEX NO.
D401	115
D452	138

FUSE

SYMBOL NO.	INDEX NO.
FU401	112
(FU401)	111

COIL

SYMBOL NO.	INDEX NO.
L401	131
L402	131
L451	132

RECTIFIER

SYMBOL NO.	INDEX NO.
DB401	121

PHOTOCOUPLER

SYMBOL NO.	INDEX NO.
PC401	120
PC402	120

RESISTOR

SYMBOL NO.	INDEX NO.
R401	123
R402	123
R403	135
R404	134
R405	133
R406	136
R411	124
R412	124
R413	137
R414	137

SYMBOL NO.	INDEX NO.
R451	122

RELAY

SYMBOL NO.	INDEX NO.
RA401	113
RA402	114

PIN

SYMBOL NO.	INDEX NO.
T401	102
T402	101
T403	101
T404	101
T405	101
T406	101
T407	101

TRANSFORMER

SYMBOL NO.	INDEX NO.
TR401	2

TRIAC

SYMBOL NO.	INDEX NO.
TRC401	3
TRC402	4

VARIABLE RESISTOR

SYMBOL NO.	INDEX NO.
VR401	125

ZENER DIODE

SYMBOL NO.	INDEX NO.
ZD401	118
ZD402	119
ZD403	117
ZD404	116

32. AC DRIVE BOARD - 220/240V (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A048 5620	AC Drive Board - 220/240V	1
1	A048 5428	Shorted Connector - 220/240V	1
2	AZ10 0002	Transformer - 220,240V/13V	1
3	1405 0218	Triac - 600V 5A	1
4	1405 0212	Triac - 600V 10A	1
101	1100 0657	Fastening Tab	
102	1100 1575	Fastening Tab	
103	1102 0484	Connector - 3P	
104	1102 0959	Connector - 3P	
105	1102 1823	Connector - 2P	
106	1102 3601	Connector - 2P	
107	1102 4208	CT Header - 9P	
108	1102 4868	Connector - 3P - Black	
109	1103 1445	Wafer - 2P	
110	1103 1446	Wafer - 2P	
111	1104 0375	Fuse Holder	
112	1107 0486	Fuse - 8A, 250V	
113	1208 1278	Relay - AC250V 10A	
114	1208 1279	Relay - AC250V 5A	
115	1401 0612	Diode - 1S1585	
116	1402 0407	Zener Diode - HZ-6B3	
117	1402 0416	Zener Diode - HZ58 - 1	
118	1402 0433	Zener Diode - HZ982 - 9	
119	1402 0539	Zener Diode - HZ9C - 2	
120	1403 0521	Photocoupler - S21MD3	
121	1405 0129	Rectifier - 100V 1.0A IB4B42	
122	1600 1057	Resistor - 56k Ω 2W ±5%	
123	1600 1148	Registor - 1kΩ +/-5% 1W	
124	1601 1880	Fuse Resistor 1000HM 1/2W	
125	1601 8138	Variable Resistor - 30k Ω 0.75W	
126	1602 0920	Noise Killer - 0.1MF 120 Ω	
127	1604 1378	Capacitor - 1mF 50V	
128	1606 1121	Capacitor - 0.1uF 25V	
129	1606 1476	Capaciter - 0.22uF 250V	
130	1606 1768	Capaciter - 10MF - 5%	
131	1607 0054	Noise Filter - SN14-700	
132	1607 0394	Choke - SC-05-300	
133	1611 4103	Resistor - 10k Ω 1/4T ±5%	
134	1611 4153	Resistor - 15k Ω 1/4T ±5%	
135	1611 4223	Resistor - 22k Ω 1/4T ±5%	
136	1611 4242	Resistor - 2.4k Ω 1/4T ±5%	
137	1611 4820	Resistor - 82 Ω 1/4T ±5%	
138	1401 0815	Diode - 1S1588	
139	1602 0908	Noise Killer	

CAPACITOR

SYMBOL NO.	INDEX NO.
C701	126
C702	122
C703	129
C704	124
C705	126
C706	129
C707	129
C708	129
C709	129
C710	128

SYMBOL NO.	INDEX NO.
C711	128
C712	122
C713	129
C715	129
C716	125
C717	125
C718	130
C719	121
C720	130
C721	124

SYMBOL NO.	INDEX NO.
C722	130
C723	122
C724	130
C726	129
C727	127
C728	130
C729	127
C730	129
C731	129
C732	123

CONNECTOR

SYMBOL NO.	INDEX NO.
CN701	105
CN702	103
CN703	104
CN704	106
CN705	102
CN706	101

DIODE

SYMBOL NO.	INDEX NO.
D700	109
D701	109
D704	111
D705	111

DIP SWITCH

SYMBOL NO.	INDEX NO.
DPS700	107

NOISE FILTER

SYMBOL NO.	INDEX NO.
EMISF	120

IC

SYMBOL NO.	INDEX NO.
IC701	112
IC702	1
IC703	114
IC704	113
IC705	115

OSCILLATOR

SYMBOL NO.	INDEX NO.
OSC700	116

TRANSISTOR

SYMBOL NO.	INDEX NO.
Q700	108

RESISTOR

SYMBOL NO.	INDEX NO.
R700	141
R701	141
R706	140
R707	140
R708	140
R709	140
R711	136
R712	136
R713	136
R714	136

SYMBOL NO.	INDEX NO.
R715	133
R716	137
R717	139
R718	131
R719	142
R720	138
R721	133
R722	133
R723	140
R724	117

SYMBOL NO.	INDEX NO.
R725	117
R726	137
R727	134
R728	135
R731	133
R732	133
R733	133
R734	132
R735	132
R736	133

SYMBOL NO.	INDEX NO.
R737	133
R742	133
R743	132
R744	143

RESISTOR ARRAY

SYMBOL NO.	INDEX NO.
RAY700	119
RAY701	118

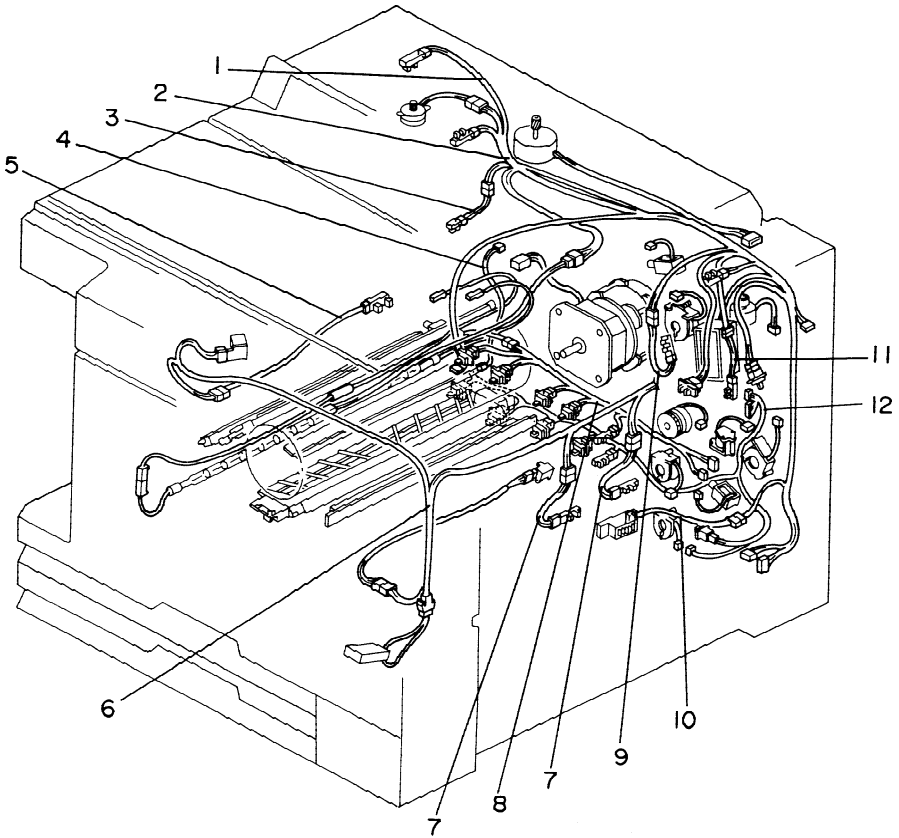
ZENER DIODE

SYMBOL NO.	INDEX NO.
ZD700	110

33. DUPLEX MAIN BOARD - 220/240V (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A491 5101	Duplex Main Board	1
1	A491 5105	IC - uPD7811H	1
101	1102 4203	CT Header - 4P	
102	1102 4205	Connector - 6P	
103	1102 4497	Connector - 13P	
104	1103 0441	Connector - 4P	
105	1103 1770	Connector - 4P	
106	1103 1772	Pin Header - 6P	
107	1204 1482	DIP Switch	
108	1400 0208	Transistor - 2SC945	
109	1401 0815	Diode - 1S1588	
110	1402 0277	Zener Diode - 1Z12	
111	1402 0841	Diode - RK34	
112	1407 1348	IC - TD62304AP	
113	1407 1535	IC - TD62308AP	
114	1407 3478	IC - SLA7024M	
115	1408 0258	IC - AN6914	
116	1503 0071	Oscillator - 12MHz	
117	1600 1295	Resistor - 0.82 Ω 2W ±5%	
118	1601 7354	Resistor Array - 10K Ω	
119	1601 7374	Resistor Array - 4.7K Ω	
120	1602 7032	Noise Filter - 2200pF 250V 7A	
121	1604 1363	Capacitor - 10uF ±20% 25V	
122	1604 1367	Capacitor - 100uF ±20% 25V	
123	1604 1379	Capacitor - 2.2uF ±20% 50V	
124	1604 1386	Capacitor - 100uF ±20% 50V	
125	1606 1129	Capacitor - 30pF ±5% 50V	
126	1606 1329	Capacitor - 330pF ±10% 50V	
127	1606 1330	Capacitor - 470pF ±10% 50V	
128	1606 1333	Capacitor - 2200pF -20% +80% 50V	
129	1606 1336	Capacitor - 10000pF -20% +80% 50V	
130	1606 1458	Capacitor - 0.1uF -20% +80% 50V	
131	1611 4101	Resistor - 100 Ω 1/4T ±5%	
132	1611 4102	Resistor - 1K Ω 1/4T ±5%	
133	1611 4103	Resistor - 10K Ω 1/4T ±5%	
134	1611 4105	Resistor - 1M Ω 1/4T ±5%	
135	1611 4181	Resistor - 180 Ω 1/4T ±5%	
136	1611 4223	Resistor - 22K Ω 1/4T ±5%	
137	1611 4242	Resistor - 2.4K Ω 1/4T ±5%	
138	1611 4332	Resistor - 3.3K Ω 1/4T ±5%	
139	1611 4391	Resistor - 390 Ω 1/4T ±5%	
140	1611 4472	Resistor - 4.7K Ω ±5% 1/4W	
141	1611 4473	Resistor - 47K Ω 1/4T ±5%	
142	1611 4511	Resistor - 510 Ω 1/4T ±5%	
143	1611 4513	Resistor - 51K Ω 1/4T	
144	1604 1371	Capacitor - 1000uF 25V	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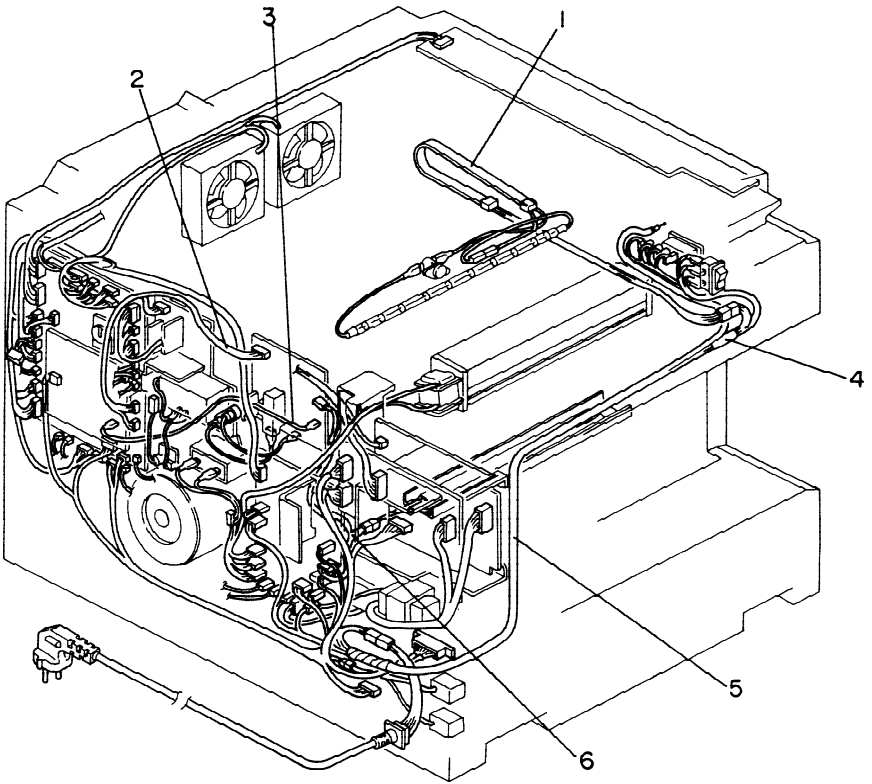
34. HARNESS I (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A054 5303	Harness - Right Rear	1
2	A048 5304	Optics Harness	1
3	A048 5325	Harness - Exit Sensor	1
4	A048 5306	P.Sensor Harness	1
5	A048 5310	Harness - Over Flow	1
6	A054 5320	Harness - Right Front	1
7	A048 5321	Harness - Paper End	1
8	A048 5300	Harness - Lower Rear	1
9	A048 5324	Harness - Toner End Sensor	1
10	A048 5314	Harness - Paper Size Sensor	1
11	A048 5323	Harness - Development Unit	1
12	A054 5385	3rd Feed Harness	1

Index No.	Part No.	Description	Q'ty per Assembly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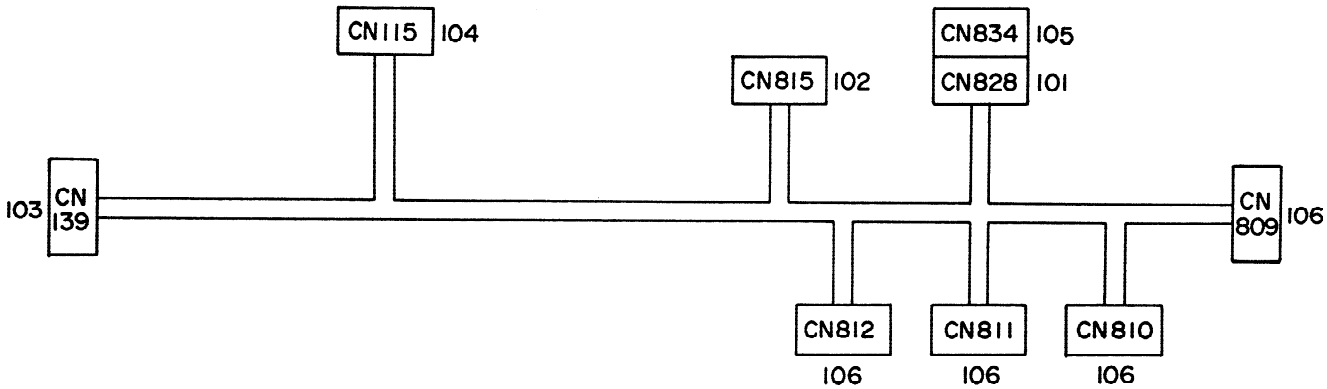
35. HARNESS II (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A048 5370	Exposure Lamp Harness	1
2	A048 5318	Harness - Rear Middle	1
3	A048 5340	Harness - High Voltage	1
4	A054 5316	AC Harness	1
5	AX40 0021	Anti-Condensation Heater - 115V 18W	1
5	AX40 0022	Anti-Condensation Heater - 240V 18W	1
6	A054 5390	Heater - Harness	1

Index No.	Part No.	Description	Q'ty per Assembly

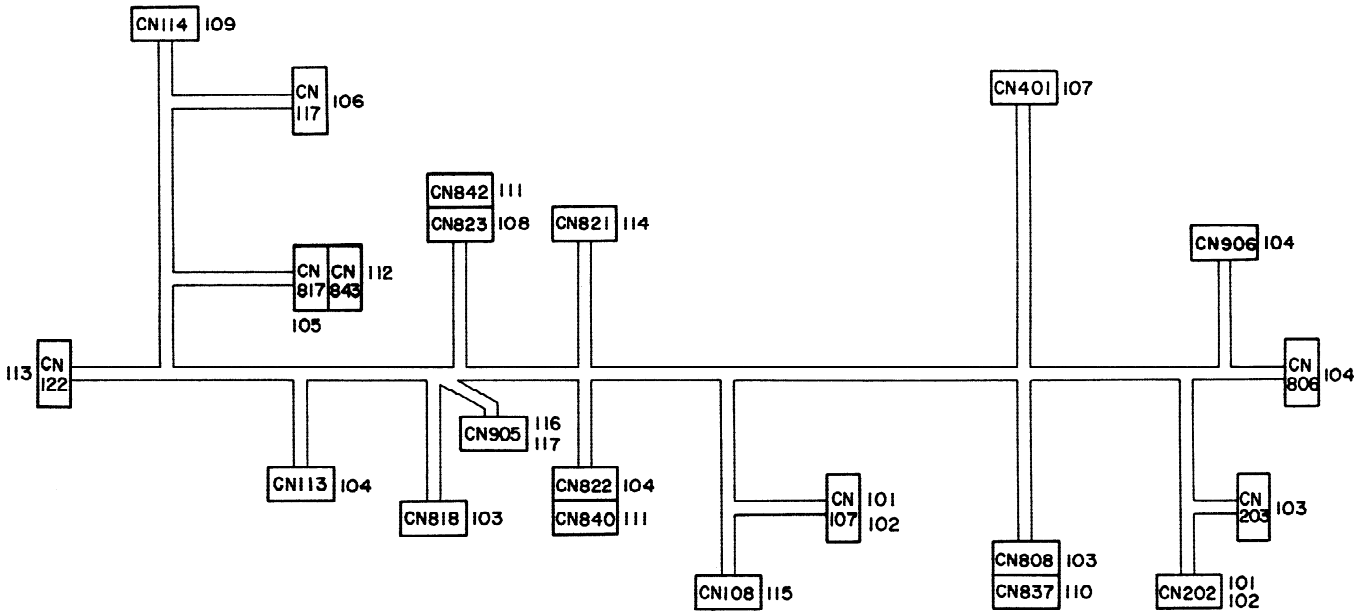

CN115
104
CN834
105
CN815
102
CN828
101
103
CN
139
CN
809
106
CN812
106
CN811
106
CN810
106

36. HARNESS - LOWER REAR (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A048 5300	Harness - Lower Rear	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1102 4213	Connector - 2P	
102	1102 4214	CT Receptacle - 3P	
103	1102 4216	CT Receptacle 5P	
104	1102 4220	CT Receptacle 9P	
105	1102 4473	CT Connector - 2P	
106	1102 4904	CT Connector - 2P - Black	

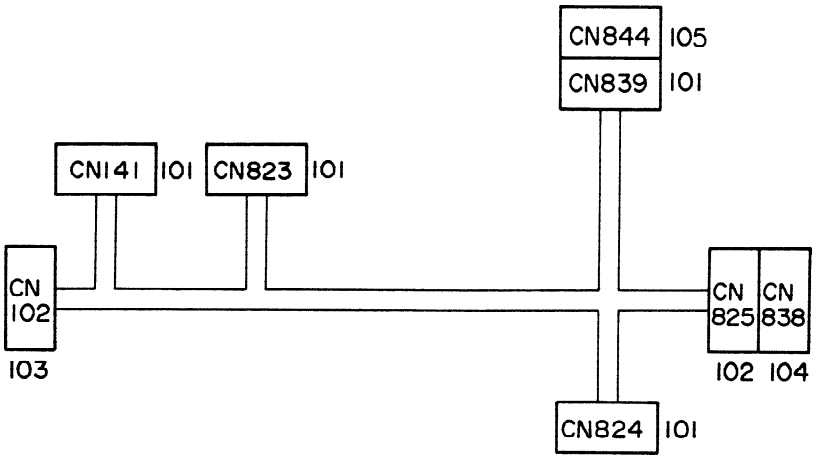

CN114 109
CN 117 106
CN842 111
CN823 108
CN821 114
CN401 107
CN906 104
CN 817 CN 843 112
105
113 CN 122
CN 806 104
CN905 116 117
CN113 104
CN818 103
CN822 104
CN840 111
CN 107 101 102
CN 203 103
CN808 103
CN837 110
CN108 115
CN202 101 102

37. HARNESS - RIGHT (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A054 5303	Harness - Right Rear	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1100 1247	Terminal	
102	1102 2061	Connector - 6P	
103	1102 4213	Connector - 2P	
104	1102 4214	CT Receptacle - 3P	
105	1102 4217	CT Receptacle 6P	
106	1102 4219	CT Receptacle 8P	
107	1102 4220	CT Receptacle 9P	
108	1102 4376	CT Receptacle - 3P	
109	1102 4381	CT Receptacle - 8P	
110	1102 4473	CT Connector - 2P	
111	1102 4559	Connector - 3P	
112	1102 4560	CT Connector 6P	
113	1102 4602	CT Connector 14P	
114	1102 4905	CT Receptacle - 3P	
115	1102 4904	CT Connector - 2P - Black	
116	1102 2025	Pin Housing - 3P	
117	1100 1330	Socket Contact	

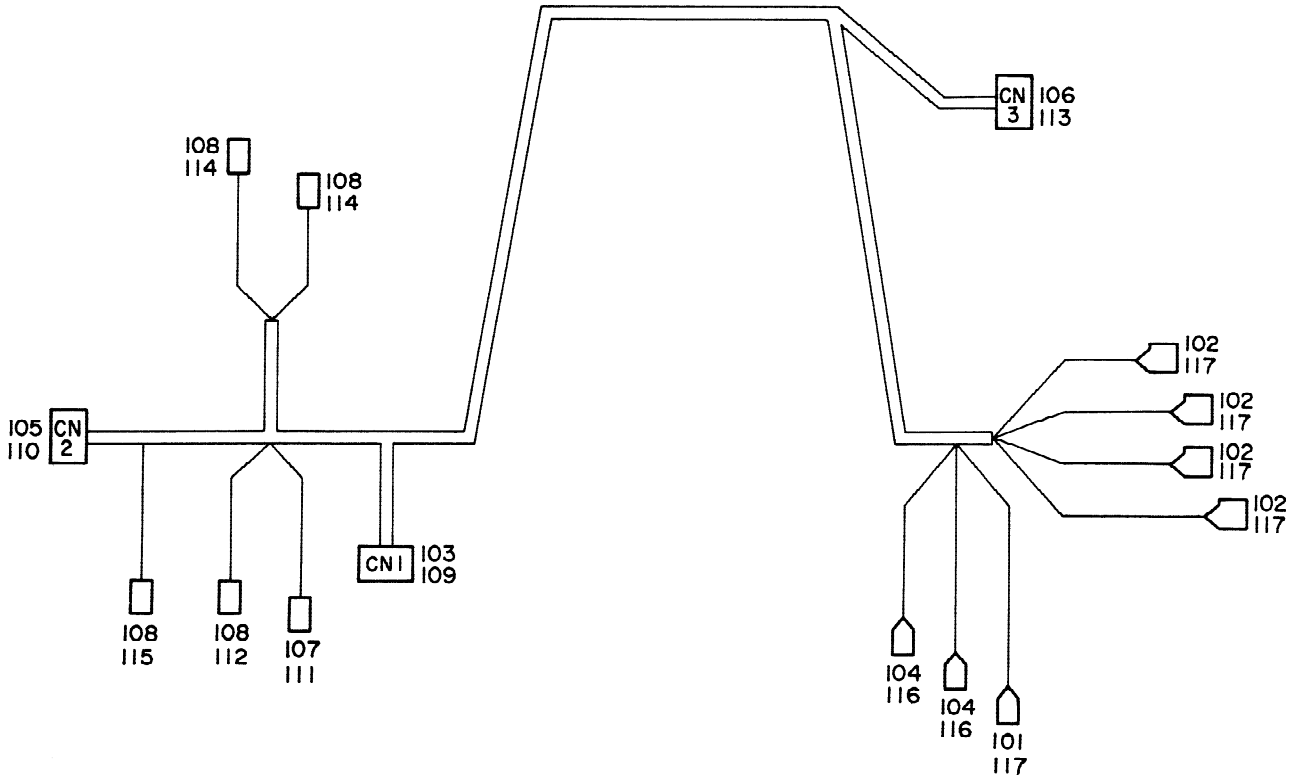

CN844
105
CN839
101
CN141
101
CN823
101
CN
102
103
CN
825
CN
838
102
104
CN824
101

38. OPTICS HARNESS (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A048 5304	Optics Harness	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1102 4214	CT Receptacle - 3P	
102	1102 4217	CT Receptacle 6P	
103	1102 4223	CT Receptacle 12P	
104	1102 4560	CT Connector 6P	
105	1102 4559	Connector - 3P	

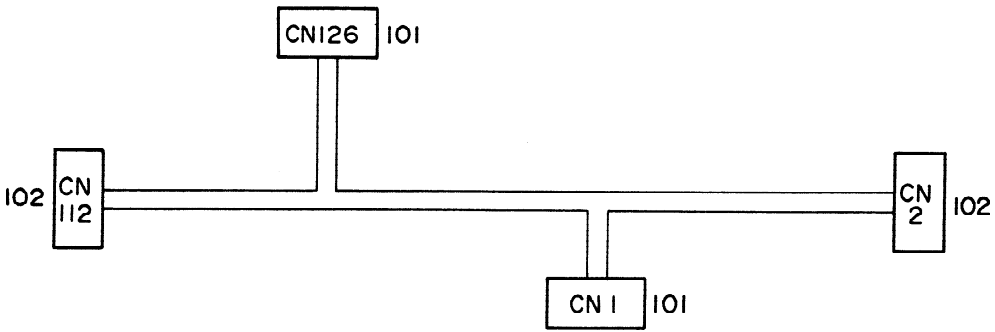

CN 3
106
113
108
114
108
114
102
117
102
117
102
117
102
117
105
110
CN 2
CN 1
103
109
108
115
108
112
107
111
104
116
104
116
101
117

39. AC HARNESS (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A054 5316	AC Harness	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1100 0300	Solid Strand	
102	1100 0301	Fastening Receptacle	
103	1100 1043	Pin - Mate-N-Lock	
104	1100 1117	Fastening Receptacle	
105	1100 1247	Terminal	
106	1100 1374	Terminal	
107	1100 1513	Contact - AWG24-20	
108	1100 1515	Connector - 2P	
109	1102 0984	Connector - 2P	
110	1102 1825	Housing - 2P	
111	1102 3995	Housing - 1P	
112	1102 3999	Receptacle Housing - 1P	
113	1102 4091	Connector - 2P	
114	1102 4109	Receptacle Housing - 1P	
115	1102 4110	Receptacle Housing - 1P - Black	
116	1102 4595	Insulating Sleeve	
117	1102 4600	Insulating Sleeve	

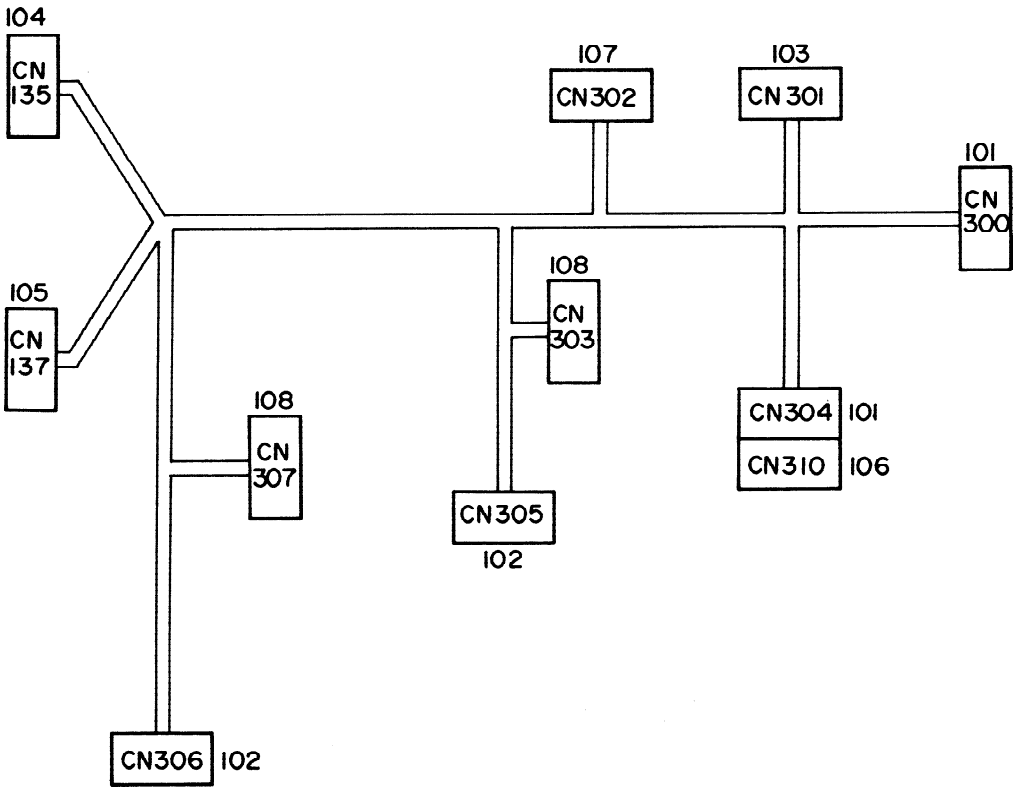

CN126
101
102
CN
112
CN
2
102
CN 1
101

40. HARNESS - RIGHT MIDDLE (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A048 5318	Harness - Rear Middle	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1102 4216	CT Receptacle 5P	
102	1102 4219	CT Receptacle 8P	

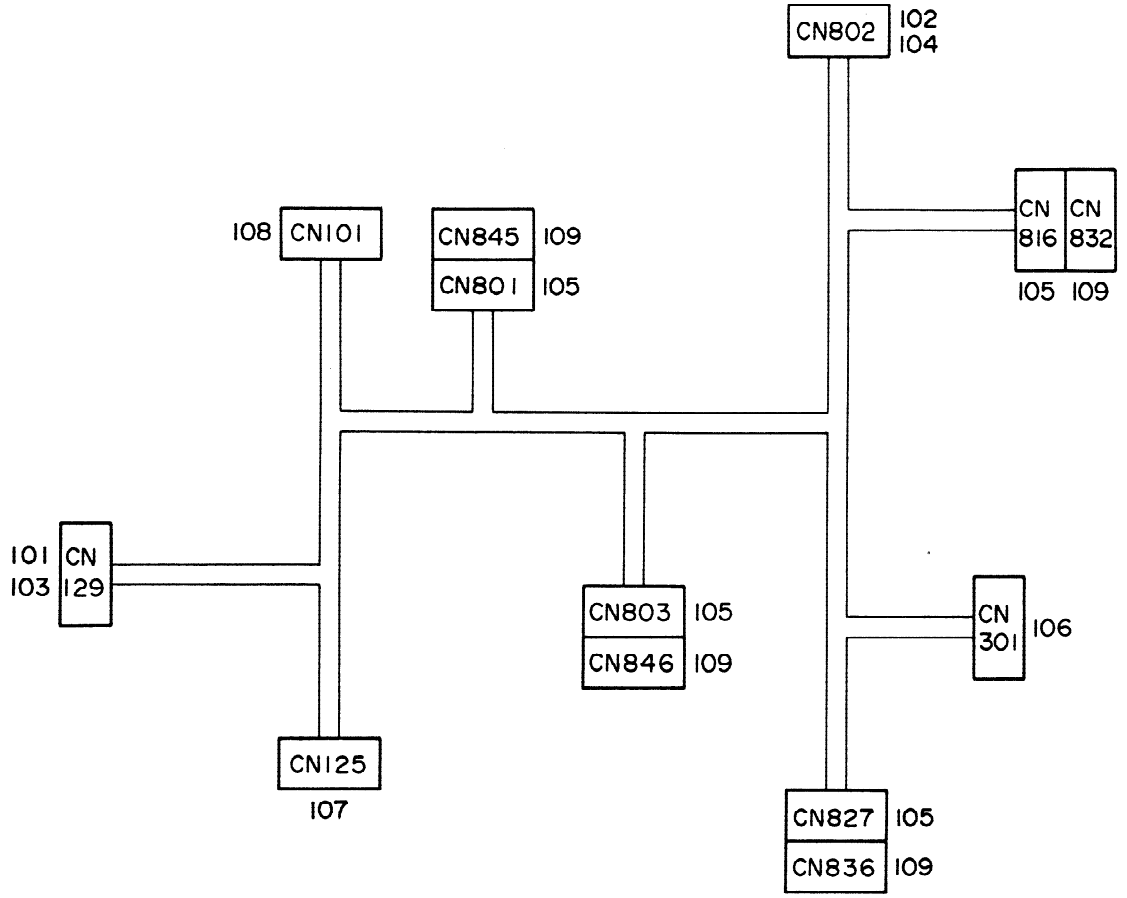

104
CN 135
107
CN302
103
CN 301
101
CN 300
105
CN 137
108
CN 303
108
CN 307
CN304 101
CN310 106
CN305
102
CN306 102

41. HARNESS - RIGHT FRONT (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A054 5320	Harness - Right Front	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1100 1329	Socket Contact	
102	1100 1330	Socket Contact	
103	1102 2012	Socket Housing - 4P	
104	1102 2055	Pin Housing - 4P	
105	1102 4214	CT Receptacle - 3P	
106	1102 4215	Connector - 4P	
107	1102 4217	CT Receptacle 6P	
108	1102 4221	CT Receptacle - 10P	
109	1102 4559	Connector - 3P	

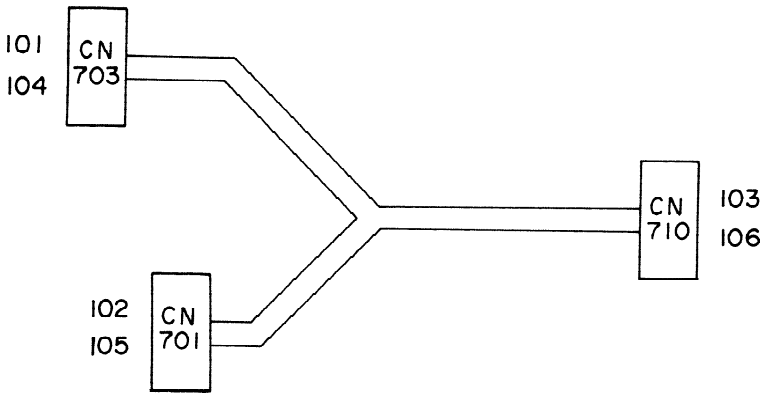

CN802
102
104
CN
816
CN
832
105
109
108
CN101
CN845
109
CN801
105
101
CN
103
129
CN803
105
CN846
109
CN
301
106
CN125
107
CN827
105
CN836
109

42. 3RD FEED HARNESS (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A054 5385	3rd Feed Harness	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1102 4213	Connector - 2P	
102	1102 4214	CT Receptacle - 3P	
103	1102 4375	Connector - 2P	
104	1102 4382	Connector - 9P	
105	1102 4384	Connector - 11P	
106	1102 4473	CT Connector - 2P	
107	1102 4893	Connector - 2P	
108	1102 4904	CT Connector - 2P - Black	

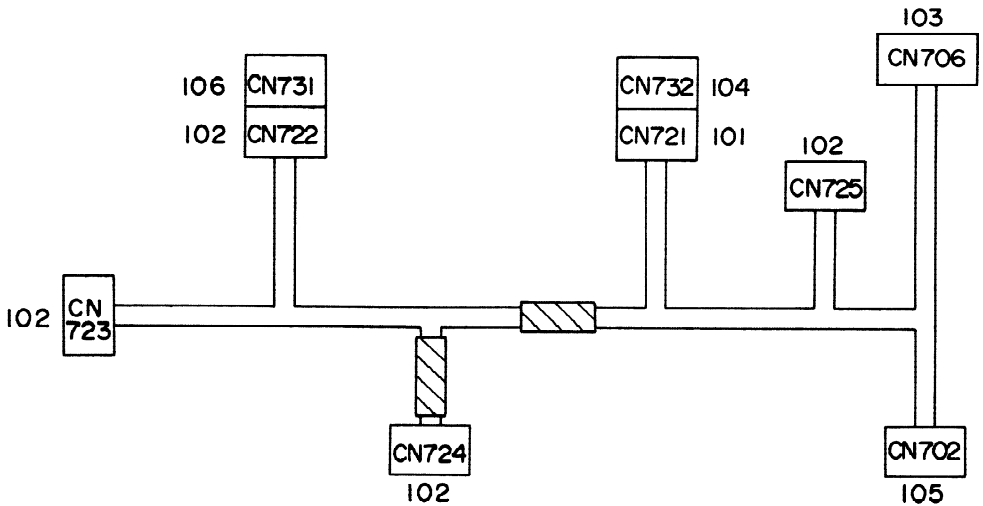

101
104
CN
703
102
105
CN
701
CN
710
103
106

43. DUPLEX HARNESS - 220/240V (A054)

December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
*	A491 5306	Duplex Harness	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1100 1247	Terminal	
102	1100 1329	Socket Contact	
103	1100 1534	Pin Contact	
104	1102 1831	Connector - 4P	
105	1102 1984	Connector - 4P	
106	1102 4800	Connector - 8P	

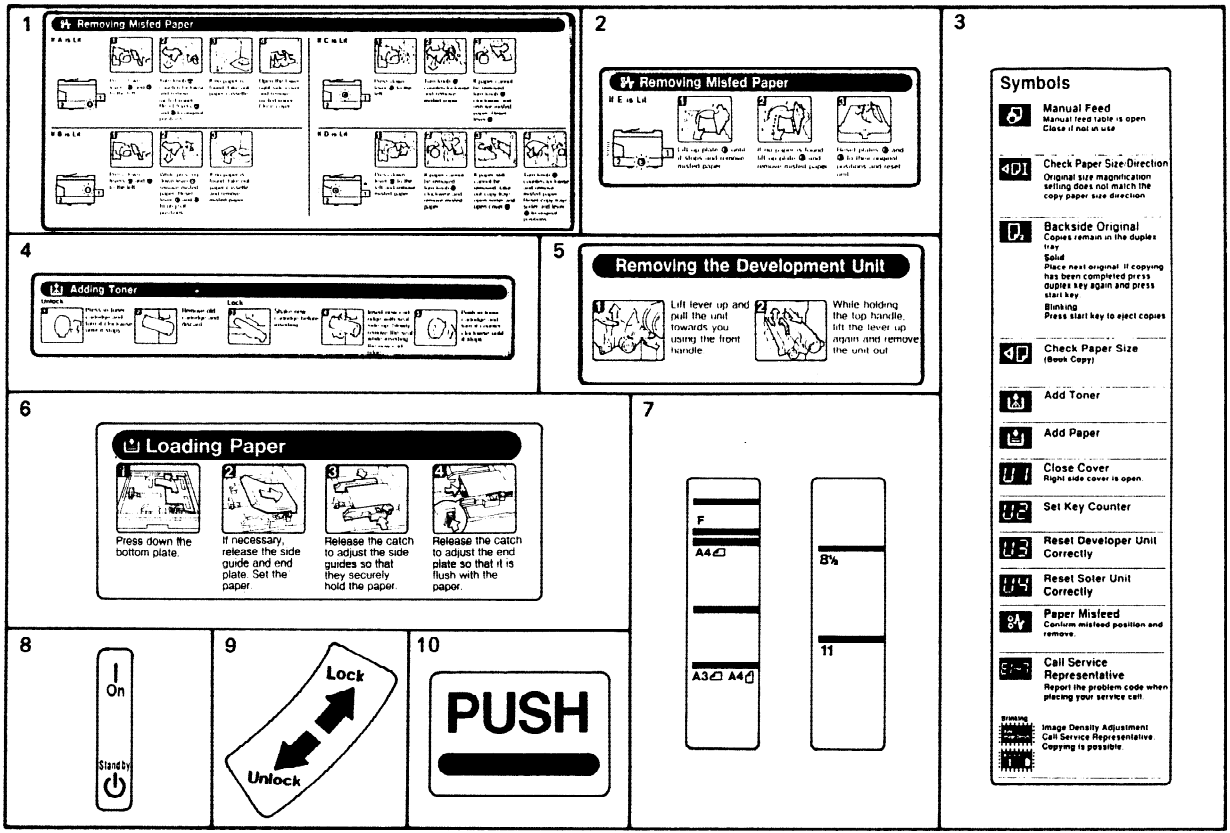

103
CN706
106
CN731
102
CN722
CN732
104
CN721
101
102
CN725
102
CN
723
CN724
102
CN702
105

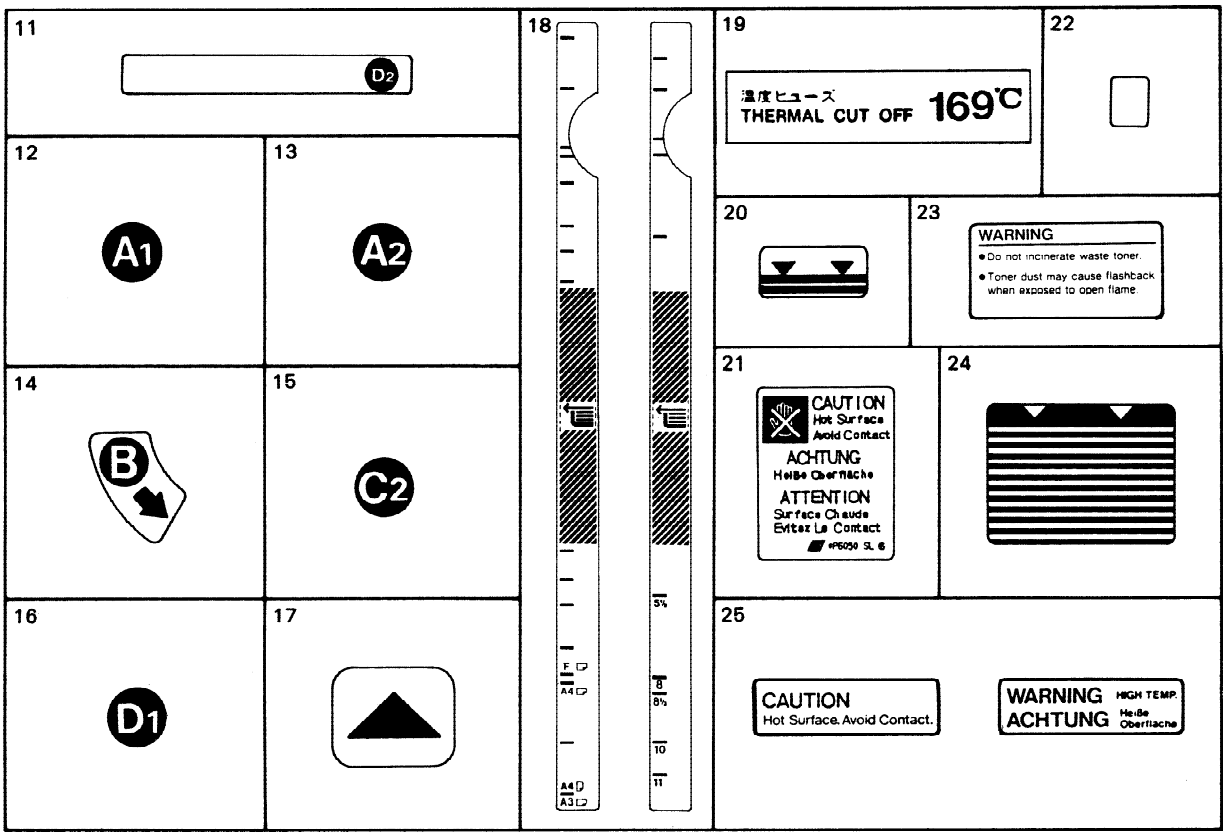
44. SENSOR HARNESS - 220/240V (A054)

December 1, '90

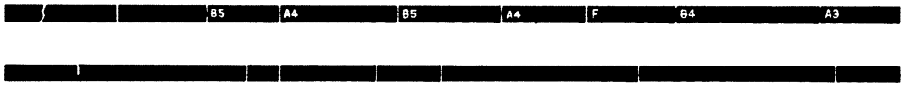
Index No.	Part No.	Description	Q'ty per Assembly
*	A491 5301	Sensor Harness	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1102 4213	Connector - 2P	
102	1102 4214	CT Receptacle - 3P	
103	1102 4215	Connector - 4P	
104	1102 4473	CT Connector - 2P	
105	1102 4484	Connector - 13P	
106	1102 4559	Connector - 3P	

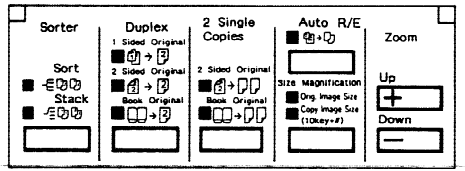

1
Removing Misfed Paper
2
Removing Misfed Paper
3
Symbols
Manual Feed
Manual feed table is open
Close if not in use
Check Paper Size/Direction
Original size magnification setting does not match the copy paper size direction
Backside Original
Copies remain in the duplex tray
Solid
Place next original. If copying has been completed press duplex key again and press start key
Blinking
Press start key to eject copies
Check Paper Size
(Book Copy)
Add Toner
Add Paper
Close Cover
Right side cover is open.
Set Key Counter
Reset Developer Unit Correctly
Reset Soter Unit Correctly
Paper Misfeed
Confirm misfeed position and remove.
Call Service Representative
Report the problem code when placing your service call.
Image Density Adjustment
Call Service Representative.
Copying is possible.
4
Adding Toner
5
Removing the Development Unit
Lift lever up and pull the unit towards you using the front handle
While holding the top handle, lift the lever up again and remove the unit out
6
Loading Paper
Press down the bottom plate.
If necessary, release the side guide and end plate. Set the paper.
Release the catch to adjust the side guides so that they securely hold the paper.
Release the catch to adjust the end plate so that it is flush with the paper.
7
F
A4
A3 A4
8½
11
8
On
Standby
9
Lock
Unlock
10
PUSH


11
D2
12
A1
13
A2
14
B
15
C2
16
D1
17
18
F
A4
A4
A3
5½
8
8½
10
11
19
温度ヒューズ
THERMAL CUT OFF 169℃
22
20
23
WARNING
● Do not incinerate waste toner.
● Toner dust may cause flashback when exposed to open flame.
21
CAUTION
Hot Surface
Avoid Contact
ACHTUNG
Heiße Oberfläche
ATTENTION
Surface Chaude
Evitez Le Contact
24
25
CAUTION
Hot Surface. Avoid Contact.
WARNING HIGH TEMP.
ACHTUNG Heiße Oberfläche

26



27

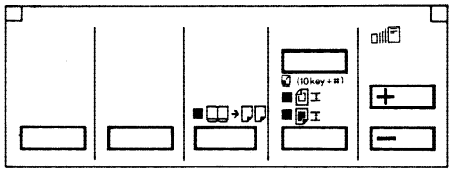


28

Reduce	%	Enlarge	%
Create Margin	93	5½×8½ ▸ 8½×14	155
11×15 ▸ 8½×11	74	8½×11 ▸ 11×17	129
11×17 ▸ 8½×11	65		

	%		%
	93	A4▸A3	A5▸A3 141
A3▸B4	B4▸B5 82	F ▸A3	F ▸A3 122
A3▸A4	A4▸A5 71		

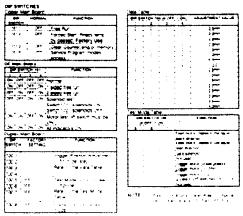
29



30

Sorter	Duplex	2 Single Copies	Reduce / Enlarge	
Sort Copies are sorted in sequential order. **Stack** Copies from a single original are stacked together.	For two-sided copies, select key for original type.	2 single copies are made from a book original or a 2 sided original. Note: Only available from 2 sided originals in ARDF mode.	**Auto R/E** Automatically selects appropriate reproduction ratio. **Size Mag.** Enter original and copy size to auto select mag. ratio.	**Zoom Up/ Zoom Down** Alter the reproduction ratio in 1% steps from 50%-200%.

31

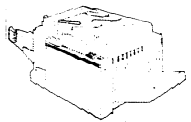


32

RICOH

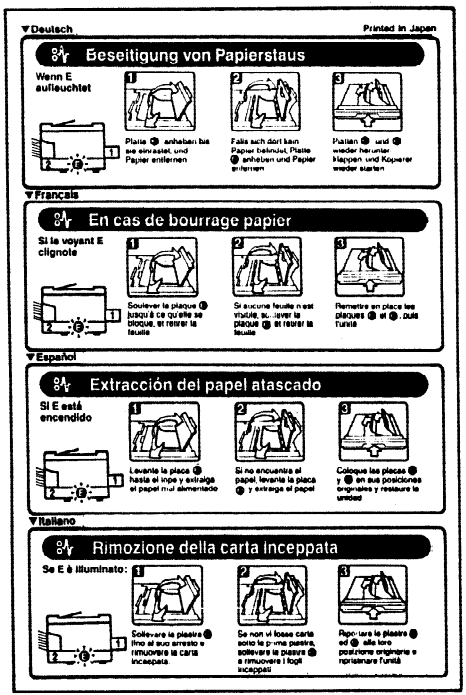
FT4418

OPERATING INSTRUCTIONS

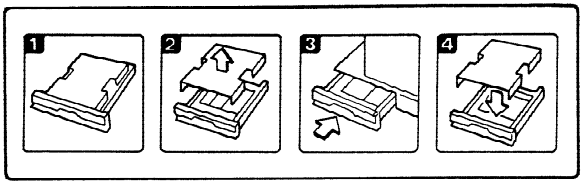


RICOH COMPANY LTD

33


▼Deutsch
Printed in Japan
Beseitigung von Papierstaus
Wenn E aufleuchtet
Platte ⓐ anheben bis sie einrastet, und Papier entfernen
Falls sich dort kein Papier befindet, Platte ⓐ anheben und Papier entfernen
Platten ⓐ und ⓑ wieder herunter klappen und Kopierer wieder starten
▼Français
En cas de bourrage papier
Si le voyant E clignote
Soulever la plaque ⓐ jusqu'à ce qu'elle se bloque, et retirer la feuille
Si aucune feuille n'est visible, soulever la plaque ⓑ et retirer la feuille
Remettre en place les plaques ⓐ et ⓑ, puis l'unité
▼Español
Extracción del papel atascado
SI E está encendido
Levante la placa ⓐ hasta el tope y extraiga el papel mal alimentado
Si no encuentra el papel, levante la placa ⓑ y extraiga el papel
Coloque las placas ⓐ y ⓑ en sus posiciones originales y restaure la unidad
▼Italiano
Rimozione della carta inceppata
Se E è illuminato:
Sollevare la piastra ⓐ fino al suo arresto e rimuovere la carta inceppata.
Se non vi fosse carta sotto la prima piastra, sollevare la piastra ⓑ e rimuovere i fogli inceppati
Riportare le piastre ⓐ ed ⓑ alla loro posizione originale e ripristinare l'unità

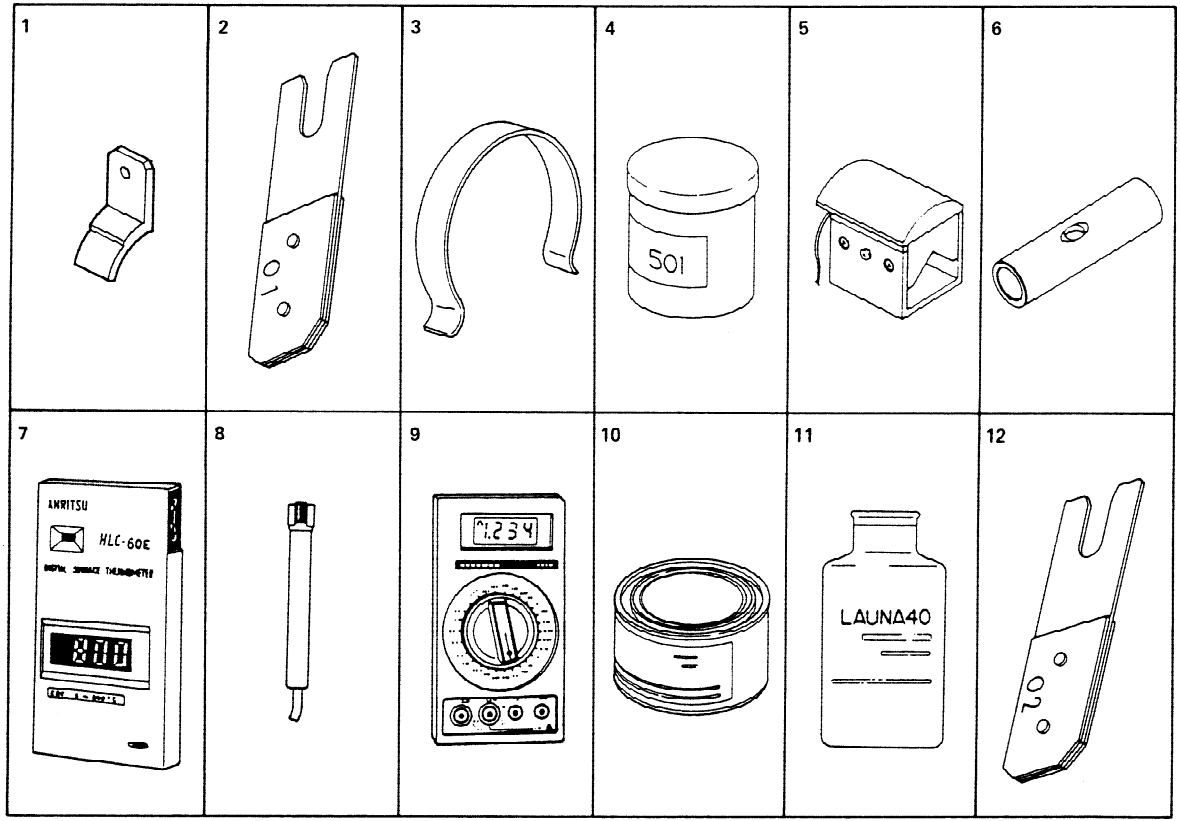
34


1
2
3
4

45. DECAL (A054)

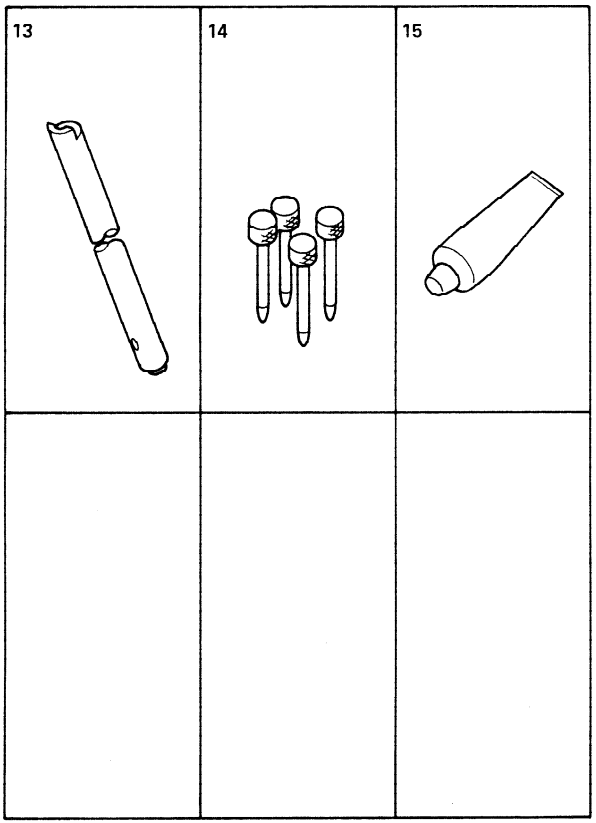
December 1, '90

Index No.	Part No.	Description	Q'ty per Assembly
1	A054 1363	Decal - Misfeed Removal	1
2	A491 4910	Decal - Removing Misfed Paper	1
3	A048 1366	Decal - Operating Instruction - LT	1
3	A048 1386	Decal - Operating Instruction - A4	1
4	A048 1364	Decal - Toner Casing	1
5	A048 1365	Decal - Development Unit	1
6	A048 2897	Decal - Paper Tray	1
6	A323 2897	Decal - Paper Tray - Option	1
7	A048 2895	Decal - Left Scale - A4	1
7	A048 2896	Decal - Left Scale - LT	1
8	A048 1367	Decal - Switch	1
9	A048 1369	Decal - Toner Cartridge Lock	1
10	AA00 1173	Decal - Bottom Plate	1
11	A048 1362	Decal - D2	1
12	A048 1356	Decal - A1	1
13	A048 1357	Decal - A2	1
14	A048 1358	Decal - B	1
15	A048 1360	Decal - C2	1
16	A048 1361	Decal - D1	1
17	5203 1349	Rear Positioning Decal-development	1
18	A048 2948	Decal - Paper Size - A4	1
18	A048 2947	Decal - Paper Size - LT	1
19	5216 4145	Thermofuse Decal	1
20	A048 2955	Decal - Manual Feed	1
21	AA00 0041	Decal - High Temperature	1
22	A054 2977	Decal - Vertical Transport Guide	2
23	AA00 0059	Caution Decal - English	1
24	AA00 1172	Decal - Paper Level	1
24	AA00 2010	Decal - Paper Level	1
25	5214 4972	Caution Decal - High Temperature - 115V	1
25	5214 4970	Caution Decal - High Temperature - 220/240V	1
26	A048 1498	Decal - Size Scale - A4	1
26	A048 1493	Decal - Size Scale - LT	1
27	A048 1495	Sheet - Operation Panel - A4	1
27	A048 1490	Sheet - Operation Panel - LT	1
28	A048 1496	Decal - Size Magnification - A4	1
28	A048 1491	Decal - Size Magnification - LT	1
29	A048 1377	Sheet - Option - LT	1
29	A048 1378	Sheet - Option - A4	1
30	A048 1492	Decal - Enter - LT	1
31	A048 1333	Service Table Sheet - English	1
32	A054 8607	Operating Instructions - LT	1
33	A491 6060	Multi Decal - Removing Misfed Paper	1
34	A491 4915	Dust Cover Decal	1


1
2
3
4
5
6
501
7
ANRITSU
HLC-60E
8
9
1234
10
11
LAUNA40
12
502

46. SPECIAL TOOL (A054)

December 1, '90



Index No.	Part No.	Description	Q'ty per Assembly
1	A048 9500	DG Gauge - 0.57/0.67 (1 pcs)	1
2	5205 9101	Gap Gauge	1
3	A006 9103	Omega Clamp	1
4	5203 9501	Grease 501	1
5	5442 9106	Drum Shoe	1
6	5447 9104	Shoe Adaptor	1
7	5420 9504	Thermo Meter - HLC	1
8	5420 9505	Probe - HLC-30	1
9	5420 9507	Digital Multimeter - Beckman	1
10	5447 9078	Heat Resisting Grease MT-78	1
11	5442 9103	Launa Oil 40	1
12	5420 9516	Test Chart - OS - A3 (10psc/Set)	1
13	A006 9105	Drum Shaft	1
14	A006 9104	Adjusting Scanner Pin (4pcs/Set)	1
15	A008 9502	Silicone Grease - G40m	1

PARTS INDEX

Part No.	Description	Paper and Index No.
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1102 4559	Connector - 3P	83-105
1102 4559	Connector - 3P	89-109
1102 4559	Connector - 3P	95-106
1102 4560	CT Connector 6P	81-112
1102 4560	CT Connector 6P	83-104
1102 4595	Insulating Sleeve	85-116
1102 4600	Insulating Sleeve	85-117
1102 4602	CT Connector 14P	81-113
1102 4619	CT Header - 2P	65-114
1102 4625	CT Connector 8P	65-115
1102 4626	Connector - 9P	65-123
1102 4628	Connector - 11P	65-186
1102 4631	CT Connector 2P	65-116
1102 4643	CT Connector 2P	65-117
1102 4800	Connector - 8P	93-106
1102 4868	Connector - 3P - Black	69-108
1102 4868	Connector - 3P - Black	71-108
1102 4893	Connector - 2P	91-107
1102 4904	CT Connector - 2P - Black	79-106
1102 4904	CT Connector - 2P - Black	81-115
1102 4904	CT Connector - 2P - Black	91-108
1102 4905	CT Receptacle - 3P	81-114
1102 5002	Connector 30P	65-118
1102 5007	CT Header - 14P	65-119
1103 0441	Connector - 4P	73-104
1103 0725	Connector - 3P	67-103
1103 1445	Wafer - 2P	69-109
1103 1445	Wafer - 2P	71-109
1103 1446	Wafer - 2P	69-110
1103 1446	Wafer - 2P	71-110

Part No.	Description	Paper and Index No.
1103 1770	Connector - 4P	65-120
1103 1770	Connector - 4P	73-105
1103 1771	Connector - 5P	65-121
1103 1772	Pin Header - 6P	65-122
1103 1772	Pin Header - 6P	73-106
1103 1798	Pin Header - 4P	65-124
1104 0351	Fuse Holder	67-128
1104 0370	IC Socket - 64P	65-185
1104 0375	Fuse Holder	69-111
1104 0375	Fuse Holder	71-111
1104 0588	DIP Socket - 28P	65-125
1105 0159	PCB Stud	11-110
1105 0159	PCB Stud	19-109
1105 0159	PCB Stud	29-111
1105 0159	PCB Stud	59-112
1105 0159	PCB Stud	61-107
1105 0159	PCB Stud	63-107
1105 0160	Clamp	57-111
1105 0162	Locking Support	57-112
1105 0183	Spacer	57-109
1105 0183	Spacer	61-110
1105 0183	Spacer	63-110
1105 0193	Nylon Stud	57-110
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1105 0199	Clamp	13-105
1105 0199	Clamp	21-109
1105 0199	Clamp	29-109
1105 0199	Clamp	31-103
1105 0199	Clamp	49-115
1105 0199	Clamp	55-110
1105 0199	Clamp	57-107
1105 0199	Clamp	59-111
1105 0199	Clamp	61-111

Part No.	Description	Paper and Index No.
1105 0199	Clamp	63-111
1105 0230	Clamp	11-108
1105 0230	Clamp	19-110
1105 0230	Clamp	29-110
1105 0230	Clamp	53-107•
1105 0230	Clamp	55-109
1105 0230	Clamp	57-108
1105 0230	Clamp	61-112
1105 0230	Clamp	63-112
1105 0231	Clamp	11-111
1107 0354	Fuse - 3.15A/125V	61-106
1107 0354	Fuse - 3.15A/125V	63-106
1107 0354	Fuse - 3.15A/125V	67-105
1107 0391	Fuse - 5A, 125V	61-108
1107 0391	Fuse - 5A, 125V	63-108
1107 0457	Fuse - 3.15A 250V	67-104
1107 0485	Fuse - 15A, 125V	69-112
1107 0486	Fuse - 8A, 250V	61-105
1107 0486	Fuse - 8A, 250V	63-105
1107 0486	Fuse - 8A, 250V	71-112
1109 0159	PCB Stud	57-113•
1204 1373	Push Switch	55- 4
1204 1422	DIP Switch	65-126
1204 1482	DIP Switch	73-107
1204 1576	Main Switch	55- 3
1208 1277	Relay - AC250V 16A	69-113
1208 1278	Relay - AC250V 10A	71-113
1208 1279	Relay - AC250V 5A	69-114
1208 1279	Relay - AC250V 5A	71-114
1400 0208	Transistor - 2SC945	67-106
1400 0208	Transistor - 2SC945	73-108
1400 0369	Transistor - 2SA1213Y	65-127
1401 0298	Transistor - 2SC2712Y	65-128
1401 0612	Diode - 1S1585	69-115
1401 0612	Diode - 1S1585	71-115

Part No.	Description	Paper and Index No.
1401 0815	Diode - 1S1588	69-135
1401 0815	Diode - 1S1588	71-138
1401 0815	Diode - 1S1588	73-109
1402 0277	Zener Diode - 1Z12	65-129
1402 0277	Zener Diode - 1Z12	73-110
1402 0388	Diode - W03C	67-107
1402 0407	Zener Diode - HZ-6B3	69-116
1402 0407	Zener Diode - HZ-6B3	71-116
1402 0416	Zener Diode - HZ58 - 1	69-117
1402 0416	Zener Diode - HZ58 - 1	71-117
1402 0433	Zener Diode - HZ982 - 09	69-118
1402 0433	Zener Diode - HZ982 - 09	71-118
1402 0467	Diode - S5566G	67-108
1402 0476	Diode - 1SS184	65-130
1402 0478	Diode - 1SS226TE85L	65-131
1402 0513	Diode - EK03	65-133
1402 0539	Zener Diode - HZ9C - 2	69-119
1402 0539	Zener Diode - HZ9C - 2	71-119
1402 0601	Rectifier - RBV-401	67-109
1402 0804	Diode - 1SS294	65-132
1402 0841	Diode - RK34	73-111•
1403 0521	Photocoupler - S21MD3	71-120
1403 0614	Photo Triac - PB01AP-8	69-120
1404 0131	Varistor - ERZ-CIODK271U	69-136
1405 0129	Rectifier - 100V 1.0A IB4B42	69-121
1405 0129	Rectifier - 100V 1.0A IB4B42	71-121
1405 0210	Triac - 400V 10A	69- 3
1405 0211	Triac - 400V 16A	69- 2
1405 0212	Triac - 600V 10A	71- 4
1405 0218	Triac - 600V 5A	71- 3
1407 1348	IC - TD62304AP	73-112
1407 1535	IC - TD62308AP	73-113
1407 1741	IC - SN74LS32NS	65-134
1407 1772	IC - SN74HC04NS	65-135
1407 1813	IC - SN74LS11NS	65-136

Part No.	Description	Paper and Index No.
1407 1882	IC - SN74LS373NS	65-137
1407 2054	IC - TD62308F	65-138
1407 2055	IC - TD62304F	65-139
1407 2077	IC - SN74LS138NS	65-140
1407 2187	IC - SN74LS07NS	65-141
1407 2230	IC - TD6F62303F	65-142
1407 2231	IC - TD62308AF	65-143
1407 2344	Transistor Array - TD62382F	65-144
1407 2746	IC - CXD1095Q	65-147
1407 3381	IC - TC74HC4066AF	65-145
1407 3422	IC - SLA7024M	65-148
1407 3478	IC - SLA7024M	73-114
1407 3533	IC - TC74HC241AF	65-146
1408 0258	IC - AN6914	73-115
1408 0537	IC - TL7705CPS	65-149
1408 0569	IC - NJM78M05F-A	67-110
1408 0604	IC - UPC393	65-150
1408 0753	IC - NJM78M24FA	67-111
1503 0071	Oscillator - 12MHz	65-151
1503 0071	Oscillator - 12MHz	73-116
1600 0678	Resistor - 4.7k Ω 1W	67-112
1600 0681	Resistor - 510 Ω ±5% 1W	67-113
1600 1057	Resistor - 56k Ω 2W ±5%	71-122
1600 1148	Registor - 1kΩ +/-5% 1W	69-122
1600 1148	Registor - 1kΩ +/-5% 1W	71-123
1600 1295	Resistor - 0.82 Ω 2W ±5%	65-152
1600 1295	Resistor - 0.82 Ω 2W ±5%	73-117
1601 1880	Fuse Resistor 1000HM 1/2W	69-123
1601 1880	Fuse Resistor 1000HM 1/2W	71-124
1601 7354	Resistor Array - 10K Ω	73-118
1601 7374	Resistor Array - 4.7K Ω	73-119
1601 8138	Variable Resistor - 30k Ω 0.75W	69-124
1601 8138	Variable Resistor - 30k Ω 0.75W	71-125
1601 8171	Variable Resistor - 2k Ω ±20%	65-153
1601 8445	Resistor - 200K Ω 0.3W	65-154

Part No.	Description	Paper and Index No.
1602 0895	Noise Killer - 0.1mF, 120 Ω	69-125
1602 0908	Noise Killer	69-137
1602 0908	Noise Killer	71-139•
1602 0920	Noise Killer - 0.1MF 120 Ω	71-126
1602 7032	Noise Filter - 2200pF 250V 7A	65-155
1602 7032	Noise Filter - 2200pF 250V 7A	73-120
1604 1353	Capacitor - 47uF 10V	65-156
1604 1363	Capacitor - 10uF ±20% 25V	73-121
1604 1367	Capacitor - 100uF ±20% 25V	73-122
1604 1371	Capacitor - 1000uF 25V	73-144
1604 1378	Capacitor - 1mF 50V	67-114
1604 1378	Capacitor - 1mF 50V	69-126
1604 1378	Capacitor - 1mF 50V	71-127
1604 1379	Capacitor - 2.2uF ±20% 50V	73-123
1604 1381	Capacitor - 4.7uF 50V	65-158
1604 1382	Capacitor - 10uF 50V	65-159
1604 1382	Capacitor - 10uF 50V	67-115
1604 1386	Capacitor - 100mF 50V	65-160
1604 1386	Capacitor - 100uF ±20% 50V	73-124
1604 2154	Capacitor - 2200uF ±20% 16V	65-157
1604 2240	Capacitor - 3300uf 63V	67-118
1604 2277	Capacitor - 10000uF 25V	67-116
1604 2289	Capacitor - 4700uF ±20% 50V	67-117
1605 0355	Capacitor - 2200pF 2kV	65-162
1606 0286	Capacitor - 100pF ±5% 50V	65-163
1606 0996	Capacitor - 470pF 50V	67-119
1606 1121	Capacitor - 0.1uF 25V	69-127
1606 1121	Capacitor - 0.1uF 25V	71-128
1606 1129	Capacitor - 30pF ±5% 50V	73-125
1606 1329	Capacitor - 330pF ±10% 50V	73-126
1606 1330	Capacitor - 470pF ±10% 50V	73-127
1606 1333	Capacitor - 2200pF - 20% +80% 50V	73-128
1606 1336	Capacitor - 10000pF -20% +80% 50V	67-120
1606 1336	Capacitor - 10000pF -20% +80% 50V	73-129
1606 1396	Capacitor - 0.1uF 25V	67-121

Part No.	Description	Paper and Index No.
1606 1451	Capacitor - 0.1uF 50V	65-164
1606 1454	Capacitor - 0.01uF 50V	65-165
1606 1455	Capacitor - 470pF 25V	65-166
1606 1458	Capacitor - 0.1uF -20% +80% 50V	73-130
1606 1472	Capacitor - 0.1uF ±20%	69-128
1606 1476	Capaciter - 0.22uF 250V	71-129
1606 1768	Capaciter - 10MF - 5%	71-130
1606 1828	Capacitor	57-11
1607 0054	Noise Filter - SN14-700	69-129
1607 0054	Noise Filter - SN14-700	71-131
1607 0394	Choke - SC-05-300	71-132
1610 0025	Resistor - 22 Ω 1/8W ±5%	65-167
1610 0035	Resistor - 100 Ω 1/8W ±5%	65-168
1610 0048	Resistor - 390 Ω 1/8W ±5%	65-169
1610 0049	Resistor - 470 Ω 1/8W ±5%	65-170
1610 0050	Resistor - 560 Ω 1/8W ±5%	65-171
1610 0053	Resistor - 1k Ω 1/8W ±5%	65-172•
1610 0057	Resistor - 1.5k Ω 1/8W ±5%	65-161
1610 0062	Resistor - 2.4 Ω ±5% 1/8W	65-173
1610 0063	Resistor - 2.7k Ω 1/8W	65-174
1610 0067	Resistor - 4.7k Ω 1/8W ±5%	65-175
1610 0071	Resistor - 10k Ω 1/8W ±5%	65-176
1610 0079	Resistor - 22k Ω 1/8W ±5%	65-177
1610 0083	Resistor - 33k Ω 1/8W ±5%	65-178
1610 0085	Resistor - 47k Ω 1/8W ±5%	65-179
1610 0337	Resistor - 510 Ω ±5% 1/8W	65-180
1611 4101	Resistor - 100 Ω 1/4T ±5%	65-181
1611 4101	Resistor - 100 Ω 1/4T ±5%	73-131
1611 4102	Resistor - 1K Ω 1/4T ±5%	73-132
1611 4103	Resistor - 10k Ω 1/4T ±5%	69-130
1611 4103	Resistor - 10k Ω 1/4T ±5%	71-133
1611 4103	Resistor - 10K Ω 1/4T ±5%	73-133
1611 4105	Resistor - 1M Ω 1/4T ±5%	73-134
1611 4106	Resistor - 10M Ω ±5% 1/4T	65-182
1611 4123	Resistor - 12k Ω 1/4T ±5%	67-122

Part No.	Description	Paper and Index No.
1611 4153	Resistor - 15k Ω 1/4T ±5%	69-131
1611 4153	Resistor - 15k Ω 1/4T ±5%	71-134
1611 4181	Resistor - 180 Ω 1/4T ±5%	73-135
1611 4220	Resistor - 22 Ω 1/4T ±5%	67-123
1611 4223	Resistor - 22k Ω 1/4T ±5%	67-124
1611 4223	Resistor - 22k Ω 1/4T ±5%	69-132
1611 4223	Resistor - 22k Ω 1/4T ±5%	71-135
1611 4223	Resistor - 22K Ω 1/4T ±5%	73-136
1611 4242	Resistor - 2.4k Ω 1/4T ±5%	69-133
1611 4242	Resistor - 2.4k Ω 1/4T ±5%	71-136
1611 4242	Resistor - 2.4K Ω 1/4T ±5%	73-137
1611 4332	Resistor - 3.3K Ω 1/4T ±5%	73-138
1611 4391	Resistor - 390 Ω 1/4T ±5%	73-139
1611 4472	Resistor - 4.7k Ω ±5% 1/4W	67-125•
1611 4472	Resistor - 4.7K Ω ±5% 1/4W	73-140
1611 4473	Resistor - 47K Ω 1/4T ±5%	73-141
1611 4511	Resistor - 510 Ω 1/4T ±5%	73-142
1611 4513	Resistor - 51K Ω 1/4T	73-143
1611 4689	Resistor - 6.8 Ω 1/4T ±5%	67-126
1611 4820	Resistor - 82 Ω 1/4T ±5%	69-134
1611 4820	Resistor - 82 Ω 1/4T ±5%	71-137
1611 6102	Resistor - 1k Ω 1/2T +5%	67-127
1622 1001	Resistor - 1k Ω 1/4T ±1%	65-183
1622 1301	Resistor - 1.3k Ω 1/4T ±10%	65-184

Part No.	Description	Paper and Index No.

POWER SUPPLY UNIT (A494)

PARTS CATALOG

INTRODUCTION

This chapter instructs you the numbers and names of these parts on this machine.

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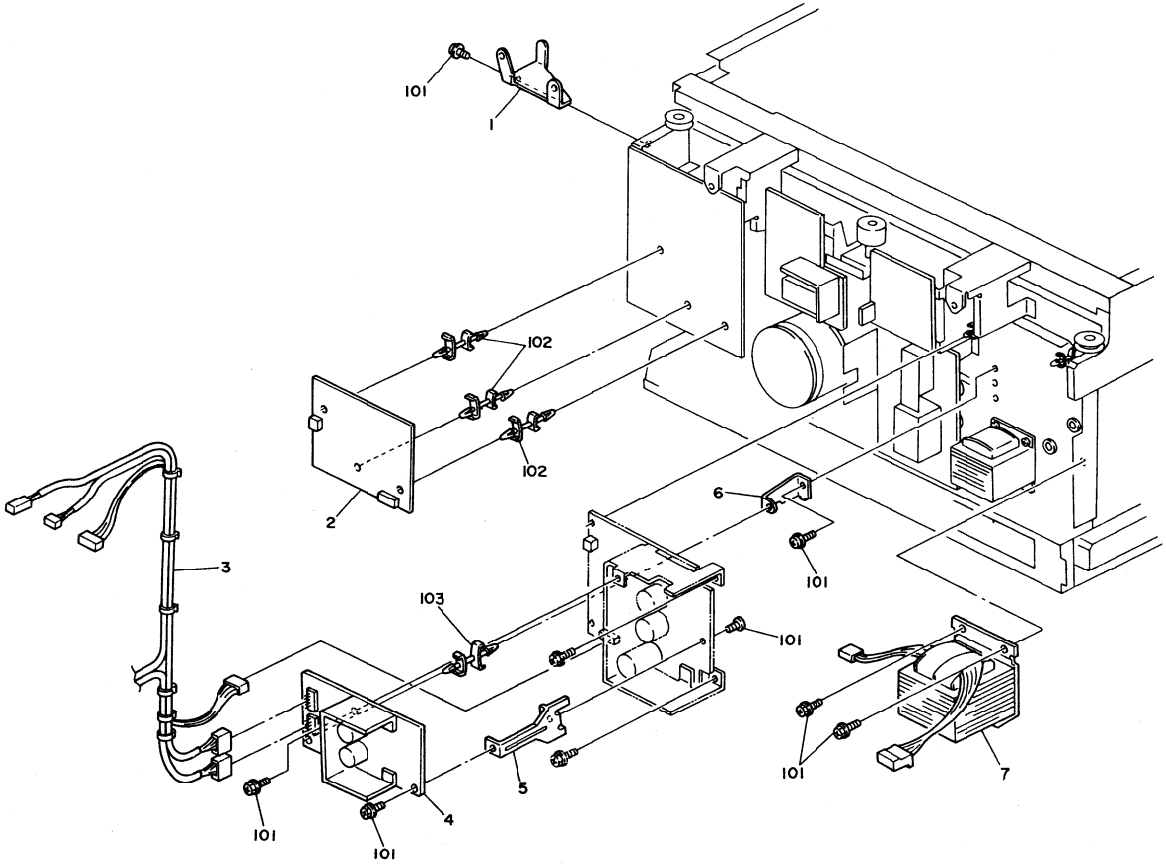
2. INTERFACE BOARD (A494) 4
3. DC DRIVE BOARD (A494) 6
4. POWER SUPPLY UNIT HARNESS (A494) 8
Parts Index 10

1. POWER SUPPLY UNIT (A494)



1. POWER SUPPLY UNIT (A494)

Index No.	Part No.	Description	Q'ty per Assembly
1	A494 5803	Bracket - DF Power Supply Cord	1
2	A494 5101	Interface Board	1
3	A494 5301	Power Supply Unit Harness - 115V	1
3	A494 5310	Power Supply Unit Harness - 220/240V	1
4	A494 5415	DC Drive Board - 115V	1
4	A494 5416	DC Drive Board - 220/240V MB2 (ADDED)	1
5	A494 5801	Small P.S.U. Bracket	1
6	A494 5802	Large P.S.U. Bracket	1
7	AZ12 0014	Transformer - 115V	1
7	AZ12 0015	Transformer - 220/240V	1

Index No.	Part No.	Description	Q'ty per Assembly
101	0443 0060W	Hexagon Head Tapping Screw - M3x6	
102	1106 0389	Locking Support	
103	1105 0159	PCB Stud MB1 (ADDED)	

2. INTERFACE BOARD (A494)

CAPACITOR

SYMBOL NO.	INDEX NO.
C201	118
C202	117
C203	120
C204	119
C205	119
C206	120
C208	120
C209	120
C211	121
C212	120

SYMBOL NO.	INDEX NO.
C213	120
C214	120

CONNECTOR

SYMBOL NO.	INDEX NO.
CN201	102
CN202	101
CN203	105
CN205	104
CN206	103

IC

SYMBOL NO.	INDEX NO.
IC201	116
IC202	114
IC203	111
IC204	110
IC206	115
IC207	112
IC208	113
IC209	109
IC221	131
IC222	131

SYMBOL NO.	INDEX NO.
IC223	131

CONNECTOR

SYMBOL NO.	INDEX NO.
JPSW201-1	107
JPSW201-2	106

PHOTOCOUPLER

SYMBOL NO.	INDEX NO.
PC201	108
PC202	108
PC203	108

RESISTOR

SYMBOL NO.	INDEX NO.
R201	129
R202	129
R203	129
R204	130
R205	130
R206	130
R207	130
R208	130
R209	130
R210	130

SYMBOL NO.	INDEX NO.
R211	130
R221	126
R222	127
R223	127
R224	124
R225	122
R226	126
R227	126
R228	123
R229	123

SYMBOL NO.	INDEX NO.
R232	126
R233	128
R234	126
R236	125
R253	126

2. INTERFACE BOARD (A494)

Index No.	Part No.	Description	Q'ty per Assembly
"	A494 5101	Interface Board	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1102 2307	Connector - 20P	
102	1102 5001	Connector - 30P	
103	1102 5003	Connector - 2P	
104	1103 1812	Pin Header - 4P	
105	1103 1815	Pin Header - 7P	
106	1103 1879	Connector - 3P	
107	1103 3029	Connector - 2P	
108	1403 0556	Photocoupler - TLP634	
109	1407 2055	IC - TD62304F	
110	1407 2187	IC - SN74LS07NS	
111	1407 2341	IC - MPD71051G	
112	1407 2344	Transistor Array - TD62382F	
113	1407 2746	IC - CXD1095Q	
114	1407 3532	IC - TC74HC4024AF	
115	1408 0456	IC - AN6914S	
116	1503 0339	Oscillator - 4.9152MHz	
117	1604 1363	Capacitor - 10uF +-20% 25V	
118	1604 1382	Capacitor - 10uF 50V	
119	1606 1451	Capacitor - 0.1uF 50V	
120	1606 1454	Capacitor - 0.01uF 25V	
121	1606 1455	Capacitor - 470pF 25V	
122	1610 0037	Resistor - 120 Ohm 1/8W +-5%	
123	1610 0041	Resistor - 180 Ohm 1/8W +-5%	
124	1610 0053	Resistor - 1K Ohm 1/8W +-5%	
125	1610 0062	Resistor - 2.4 Ohm +-5% 1/8W	
126	1610 0065	Resistor - 3.3K Ohm 1/8W +-5%	
127	1610 0071	Resistor - 10K Ohm +-5% 1/8W	
128	1610 0073	Resistor - 12K Ohm 1/8W +-5%	
129	1611 4104	Resistor - 100K Ohm 1/4W +-5%	
130	1611 4151	Resistor - 150 Ohm 1/4T +-5%	
131	1607 0352	Inductor	

3. DC DRIVE BOARD (A494)

CAPACITOR

SYMBOL NO.	INDEX NO.
C100	113
C101	111
C102	112
C103	116
C104	114
C105	111
C106	112
C107	116
C108	115
C109	115

CONNECTOR

SYMBOL NO.	INDEX NO.
CN100	101
CN101	101
CN102	101

DIODE

SYMBOL NO.	INDEX NO.
D100	106
D101	106
D102	106
D103	106

FUSE

SYMBOL NO.	INDEX NO.
FU100	103
(FU100)	102
FU101	104
(FU101)	102

IC

SYMBOL NO.	INDEX NO.
IC100	109
IC101	110

RESISTOR

SYMBOL NO.	INDEX NO.
R100	118
R101	119
R102	117
R103	118

RECTIFIER

SYMBOL NO.	INDEX NO.
ST100	107
ST101	108

ZENER DIODE

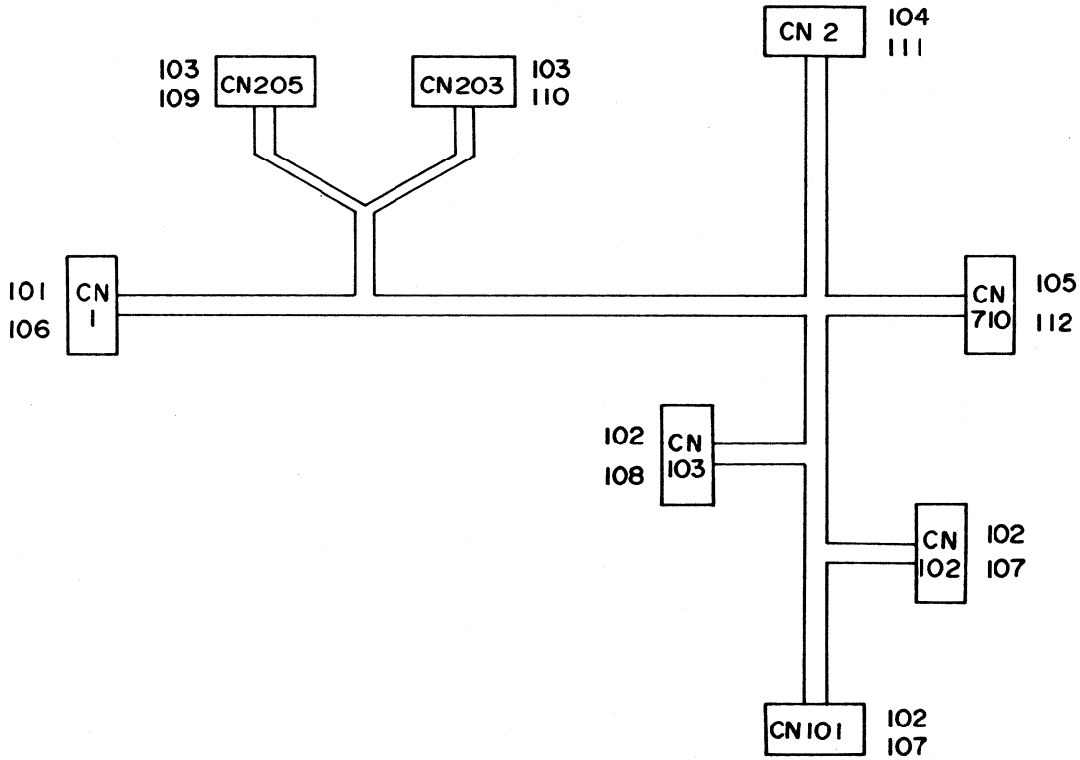
SYMBOL NO.	INDEX NO.
ZD100	105

3. DC DRIVE BOARD (A494)

Index No.	Part No.	Description	Q'ty per Assembly
*	A494 5415	DC Drive Board - 115V	1
*	A494 5416	DC Drive Board - 220/240V	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1103 0441	Pin Terminal - 4P	
102	1104 0351	Fuse Holder	
103	1107 0354	Fuse - 3.15A/125V	
103	1107 0457	Fuse - 3.15A/250V MB2 (ADDED)	
104	1107 0391	Fuse - 5A, 125V	
104	11070459	Fuse - 5A, 250V	
105	1402 0277	Zener Diode - 1Z12 (115V)	
105	1402 0951	Zener Diode - 1Z12 (220/240V)	
106	1402 0388	Diode - W03C	
107	1402 0601	Rectifier - RBV-401	
108	1405 0176	Rectifier - RBV-601	
109	1408 0569	IC - NJM78M05F-A	
110	1408 0753	IC - NJM78M24FA	
111	1604 1378	Capacitor - 1MF 50V	
112	1604 1382	Capacitor - 10uF 50V	
113	1604 2238	Capacitor - 4700uF 25V	
114	1604 2239	Capacitor - 4700uF 35V (115V)	
114	1604 2289	Capacitor - 4700uF +-20% 50V (220/240V) MB2 (ADDED)	
115	1606 0996	Capacitor - 470pF 50V	
116	1606 1396	Capacitor - 0.1uF 25V	
117	1611 4220	Resistor - 22 Ohm 1/4T +-5%	
118	1611 4689	Resistor - 6.8 Ohm 1/4T +-5%	
119	1611 6102	Resistor - 1K Ohm 1/2T +-5%	

4. POWER SUPPLY UNIT HARNESS (A494)



4. POWER SUPPLY UNIT HARNESS (A494)

Index No.	Part No.	Description	Q'ty per Assembly
*	A494 5301	Power Supply Unit Harness - 115V	1
*	A494 5310	Power Supply Unit Harness - 220/240V	1

Index No.	Part No.	Description	Q'ty per Assembly
101	1100 1239	Pin - Mate-N-Lock	
102	1100 1247	Terminal	
103	1100 1329	Socket Contact	
104	1100 1330	Socket Contact	
105	1100 1375	Pin - Mate-N-Lock	
106	1102 1509	Connector - 4P	
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